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ENTOMOLOGIST'S  
MONTHLY MAGAZINE

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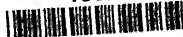
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'J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.'—*Laboulbène*.

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## ERRATA

- Page 33, line 5 from bottom, for '*spinosissima*' read '*spinosissimae*'  
 „ 96, „ 13, delete ' ; Cossidae, 3 '  
 „ 96, „ 14, for ' 2,110 ' read ' 2,107 '  
 „ 159, „ 21, for ' Australian Museum, Sydney ' read ' Canberra Museum '  
 „ 163, „ 7, for '*graccei*' read '*grassei*'  
 „ 204, „ 7, for '*aphonoides*' read '*Aphonoides*'  
 „ 209, „ 10 from bottom, for ' synonymy ' read ' synonymy '  
 „ 258, „ 14 from bottom, for '*Muscina*' read '*Polietes*'  
 „ 260, „ 9 from bottom, for '*Orthlitha*' read '*Ortholitha*'  
 Plate V: the lines intending to indicate the actual size of the ants are all much too short.

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*(Assistant Director, Imperial Institute of Entomology)*

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# THE ENTOMOLOGIST'S MONTHLY MAGAZINE

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VOLUME LXXVI  
[FOURTH SERIES, VOLUME I]

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NOTES FROM BREADALBANE, PERTHSHIRE, MAINLY ABOUT  
NEUROPTERA (s.str.) AND ODONATA.

BY KENNETH J. MORTON, F.R.E.S.

The following notes are in a way a continuation of those that appeared in 1938, *Ent. Mon. Mag.*, 74: 1-7. From May 30th to June 30th last we resided at the farm of Boreland lying at about 600 ft. above sea-level on the slope above the village of Fearnan on Loch Tay-side. The direct distance at this point between Loch Tay and the river Lyon is little over a mile and a quarter. The two basins are connected by a low pass—the road between Fearnan and Glen Lyon—Loch Tay being 350 ft. s.m., while the Lyon near Fortingal may be about 400 ft. The highest point on the road will not exceed 500 ft.: on the east side Drummond Hill rises to a height of 1,500 ft., while on the west are the foothills of the Lawers range.

The large district of Breadalbane as defined by the late Dr. F. Buchanan White (*Fauna Perthensis—Lepidoptera*, 1871) is 'drained by the Tay and its affluents, and by the Lyon and the Tay as far as the mouth of the Tummel.' He adopted as separate sub-divisions 'Tay' and 'Lyon,' both alike alpine and sub-alpine in character. Breadalbane, along with Rannoch (sub-divisions Rannoch and Garry) and the small district of Lomond with drainage to Loch Lomond, forms the western half of the much too large Watsonian Vice-County Mid-Perth (PM., sec. Balfour-Browne). Buchanan White found Watson's V.Cs. quite unsuitable for the purposes of recording the animals and plants of Perthshire, and the natural divisions and sub-divisions of the former are better and deserve the consideration of entomologists. My own captures were all from comparatively low elevations, and unless otherwise stated they are from 'Tay'; those from 'Lyon' are marked (L) except in cases where species seem to be more or less equally common to both sub-divisions.

The localities in which collections were made were all fairly near our quarters: adjoining the house a small wood containing pretty good oaks, sycamores and larches, with some younger mixed conifers, yielded little of importance; not far off a small plantation of larches; while a larger coniferous wood higher up the slope gave at most two or three Hemerobiids when an hour was spent there. These woods would probably become more productive a little later. A strip of deciduous woodland near Loch Tay with some fine oaks and many small alders and ash trees was much better, the undergrowth consisting of hazel, sloe, hawthorn and wild rose. There was little or no birch here. In Glen Lyon a good stretch of deciduous woods at the foot of Drummond Hill consisted mainly of birch in one section with some alders, hazel and sloe; further on it contained many oaks and more undergrowth of hazel, etc. At the end of May this wood was very attractive, hawthorn, hyacinths and primroses being still in full bloom. Facing north and overshadowed by Drummond Hill, it may be a rather later locality than the north side of Loch Tay (some features in the data given below may partly arise from this). Much of this hill has been replanted with conifers by the Forestry Commission in recent years; I had no opportunity of examining these young woods.

An annotated list of species belonging to the groups to which I paid particular attention follows.

## NEUROPTERA (S.STR.).

### CONIOPTERYGIDAE.

From June 2nd onwards common, but most abundant in the first half of the month. As before, they all belonged to the genus *Coniopteryx*. On this occasion I failed to find any on conifers, nearly all from oak and alder, and from birch where this was available.

*C. tineiformis* Curtis: Very common in both sub-divisions.

*C. borealis* Tjeder: 9.vi., 2 ♂♂ (Tay). The small lot kept on this date (when these insects were particularly abundant) included also 5 ♂♂ of *tineiformis* and 3 ♀♀; I cannot satisfy myself that any of the latter belong to *borealis*. A female of *C. tineiformis* taken, (L), 7.vi., has *Semidalis*-like venation.

### SISYRIDAE.

*Sisyra fuscata* Fabr.: 9.vi., one very mature ♂; it must have been blown from another part of the loch more suitable for these insects, as more than one search in the neighbourhood had no results.

## HEMEROBIIDAE.

*Eumicromus paganus* Linné: 31.v., one teneral from a small spruce.

*Hemerobius humulinus* Linné: Sparingly in both sub-divisions between 1-19.vi.

*H. perelegans* Steph.: (L), 10.vi., 1 ♂; 21.vi., 1 ♀. The other known Perthshire locality is Rannoch, where I have taken it singly on two occasions. It seems to be very local; judging from a wider experience of it in Kintyre (Argyll) it has, perhaps, a preference for birches growing in dampish bottoms.

*H. simulans* Walker: 31.v., 17-23.vi., 3 ♀ ♀; (L), 21.vi., 1 ♀; all brownish specimens. In referring to the species in my former Glen Lyon notes I wrote that it appeared to have two broods in Scotland as in the south. I find, however, that Tjeder (*in litt.*, 28.vii.1931) suggested that the dark spring specimens had hibernated, adding 'these latter are of a much more reddish coloration (reddish brown with almost red pterostigma), while specimens captured in the autumn are of a more greyish colour.' Hibernation seems quite possible, but it may be rather difficult to find proofs.

*H. stigma* Stephens: 31.v. to end of vi. but not common. Quite a number seen in the Black Wood, Rannoch, on June 4th, when we spent an hour or two there.

*H. atrifrons* McLach.: 30.v., 2 ♀ ♀; 3.vi., 1 ♀; from larch.

*H. micans* Olivier: 3.vi., 23.vi., two from spruce. Its absence from the deciduous woods was remarkable, as it had been out in numbers in the Roslin woods since May 10th.

*H. lutescens* Fabr.: From 4.vi. not uncommon, mostly from oak; (L), 5.vi., 1 ♂.

*H. marginatus* Stephens: In both sub-divisions from 20th but mostly tenerals.

*Kimminsia nervosa* Fabr.: (L), 1.vi. to 22.vi., 1 ♂, 6 ♀ ♀, all probably of the spring brood, which may have been quite over on Tayside, where it is well known later in the season.

*Wesmaelius concinnus* Steph.: 27.vi., 1 ♀, teneral, from pine.

*Symphorobius inconspicuus* McLach.: 20.vi., 1 ♀, teneral, pine.

## CHRYSOPIDAE.

These insects, which in 1937 were nearly absent in upper Glen Lyon, proved to be better represented lower down, though hardly to be called common, up to the end of June. On Loch Tayside they were more numerous. The two species marked with an asterisk (\*)

are not mentioned as occurring in Perthshire in F. J. Killington's Monograph of the British Neuroptera, Vol. 2 (London, 1937).

\**Chrysopa flava* Scop.: 6.vi. to 29.vi., common; (L), 22.vi., 1 ♀.

*C. vittata* Wesmael: 9.vi., 1 ♂; (L), 21.vi., 1 ♀?; 22.vi., 1 ♂, 2 ♀♀.

*C. ciliata* Wesmael: A few from both sub-divisions, 5.vi. to 26.vi. In Scottish localities further south where I have collected, this, as a rule, is the most numerous species.

\**C. albolineata* Killington (= *tenella* Schneider): 6.vi. to 29.vi., ten in all. This Loch Tay locality seems to be the most westerly yet known to me. Other County records are: East Lothian, Midlothian, Clackmannan and Aberdeen.

#### MEGALOPTERA.

*Sialis fuliginosa* Linné: (L), 7.vi., 1 ♂; at a small burn, tributary of the Lyon; others seen there.

#### MECOPTERA.

*Panorpa germanica* Linné: 24.vi., 1 ♀ near the house on one of our bleakest days.

#### ODONATA.

As far as I know it, the eastern part of this district is not a good one for dragonflies. The only species met with were *Pyrrhosoma nymphula* Sulz., which occurred at the small burn mentioned under *Sialis fuliginosa* and a single example of *Cordulegaster annulatus* Latreille near another small burn not far from the house. It was pleasing, however, on the afternoon of the 19th in an interval of sunshine to see a ♂ of *Aeschna coerulea* Ström in Glen Lochay not very far from the ground on the opposite side of the river, where I first discovered the species in 1895. My son, fishing lower down the river, saw another; he knows the species quite well, his first contact with it having been made in July, 1915, at an Inverness-shire locality when he was an active youngster of eight.

Perhaps I may add that in the autumn of 1930 I discovered a small lochan or marsh a mile or two S.E. of Lawers, and quite near Loch Tay, where a number of *Ae. juncea* Linné and *Sympetrum scoticum* Don. were active on September 14th and 15th, the weather being sunny and dry but the wind in the north. On the 17th there was sharp frost and the dragonflies were seen no more, although Hemerobiids and autumnal Trichoptera were numerous up to September 24th, when we left. Unfortunately it was not convenient for me to search for this place again in June.

The month was not too favourable for insect life. The hot dry weather prevailing at the end of May continued until June 6th, when it began to grow cooler. Snow was reported on the high tops on the 12th, and though the next day was bright and warm in the sun, for the rest of the month the weather was unsettled and mostly cool or cold. It also remained too dry; only two days were completely wet and there was little rain otherwise.

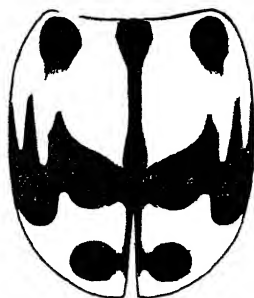
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September 30th, 1939.

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*ADONIA VARIEGATA* GOEZ., AB. *LEMANI* N.AB.: AN ABERRATION  
OF A BRITISH COCCINELLID NEW TO SCIENCE.

BY HORACE DONISTHORPE, F.Z.S., F.R.E.S., ETC.

When hunting for *Gymnetron collinus* Gyll. and *Anthicus tobias* Mars. at Mill Hill, Middlesex, in company with Mr. Steel on October 23rd, 1938, we swept specimens of the lady-bird, *Adonia variegata* Goetz., from low herbage. He pointed out to me a very fine aberration, which I now propose to name *lemanii* after my old friend G. C. Leman, who was to have published a monograph on the Coccinellidae, but his untimely death intervened. In this form, which is neither described nor figured by Dr. Mader, 'Evidenz der paläarktischen Coccinelliden und ihren Aberrationen, 1927-35,' the central spots on the elytra are confluent in a remarkable manner,



Elytra of *Adonia variegata* Goetz. ab. *lemanii* n.ab.

but are quite uniform on each elytron. This is better shown in a sketch rather than by a description. I am indebted to Mr. A. A. Allen for the accompanying drawing.

British Museum (Nat. Hist.),  
London, S.W.7.  
November 16th, 1939.



*XYLEBORUS SAMPSONI* SP.N. (COL., SCOLYTIDAE): A BEETLE  
NEW TO BRITAIN.

BY HORACE DONISTHORPE, F.Z.S., F.R.E.S., ETC.

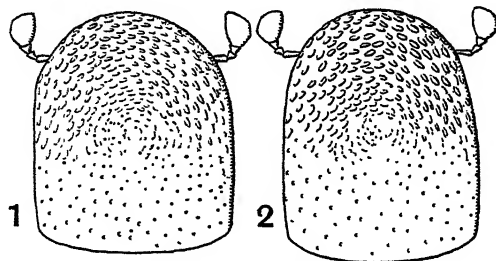
On June 17th, 1924, I took a small Scolytid beetle in the very thick bark of a large standing dead oak tree. As I was unable to name it, I sent it to the late Colonel Sainte Claire Deville, who returned it to me as *Taphrorychus villifrons* Duf., a species not known to have occurred in Britain. I recorded it as such (1924, *Ent. Rec.*, 36: 118) and put it away in my cabinet. Having had cause to look at it again recently, and having examined the underside, it proves to be a *Xyleborus*, and in my opinion a new species, which I propose to call *X. sampsoni* after the late Colonel Sampson, who was an authority on the Scolytidae.

It comes near to *X. dryographus* Ratz., but has the thorax somewhat shorter, more quadrate, more parallel-sided and more abruptly narrowed anteriorly.

The puncturation of the thorax anteriorly is not quite so rugose, but is closer, and the fine punctures posteriorly are closer and more abundant. Between these punctures it is somewhat alutaceously punctured, especially at the base, thus not being so smooth and shining as in *dryographus*. The punctured striae of the elytra are more irregular and slightly closer, and the small punctures on the interstices are also less regular, and the interstices themselves are somewhat alutaceous and therefore less smooth and shining; this is markedly so with the declivity.

Type in Coll. Donisthorpe in B.M.

*Xyleborus dryographus* Ratz. occurs in Richmond Park and not uncommonly in Windsor Forest in and under thin beech-bark and on oak and beech stumps, but I have never taken it in thick oak bark.



Figs. 1-2.—Thorax of 1, *Xyleborus sampsoni* sp.n.; 2, *X. dryographus* Ratz.

Miss Tassart's nice drawings of the thorax of the two species shows well the difference between them, though of course not the alutaceous punctuation.

British Museum (Nat. Hist.),  
London, S.W.7.

November 30th, 1939.

LARVAE OF BRITISH BEETLES.—I. A KEY TO THE GENERA AND  
MOST OF THE SPECIES OF BRITISH CERAMBYCID LARVAE.

BY FRITZ VAN EMDEN.

(Concluded from Vol. LXXV, p. 273.)

LIST OF MATERIAL STUDIED.

*Abbreviations.*—B.M., British Museum (Natural History).—coll.E., collection van Emden.—M.C., Universitetets Zoologiske Museum, Copenhagen.—num., numerous.—L, larva.—P, pupa.—I, adult.

1. PRIONINAE.

*Prionus coriarius* L.—1 L, England, from oak slab, Dr. Murie, B.M.—1 L, no data, B.M.—2 L, Kew Gardens, B.M.

[*Ergates faber* L.—5 L, France: Bay of Biscay, from *Pinus maritimus*, R. St. McDougall, B.M.—2 L, S. France: Maxime, in fir stem, Dr. Chapman, B.M.—3 L, 3 P, 3 I, no data, B.M.—1 L, Germany: Dübener Heide, nr. Leipzig, in pine stump, O. Michalk, coll.E.1134.]

[*Megopis scabricornis* Scop.—1 L, Rumania: Mehadia (Hercalesbad), 2.IV.1938, K. Dorn leg., det., ded., coll.E.2969.]

[*Parandra* spp.—1 L, Dominica, B.M.—2 L, W. Africa: S. Thomé Is., 4.XI.1932, W. H. T. Tams, B.M.—1 L, 4 P, no data, B.M.]

2. LEPTURINAE.

*Rhagium mordax* DeG.—2 L, Eastbourne, IV.1917, K. G. Blair, B.M.—1 L, Brockenhurst, from stump, B.M.—2 L, Broxbourne, 6.II.1937, in rotten oak, J. G. Howarth, B.M.—1 L, Epping Forest, K. G. Blair, B.M.—5 L, 1 I, Epping, 4.XI.1914, from oak logs, H. E. Box, B.M.—1 L, Epping Forest, 26.III.1939, W. O. Steel, B.M.—1 L, 1 P, 1 I, Germany: Münden, K. Jordan, B.M.—2 L, Germany: Leipzig-Connewitz, 5.I.1915, coll. E. 6-7. *R. bifasciatum* F.—5 L, Oxshott, Rye leg., B.M.—3 L, Oxshott, 24.V.1930, K. G. Blair, B.M.—1 L, New Forest, C. Pool, B.M.—1 L, Eastbourne, IV.1917, K. G. Blair, B.M.—3 L, Charmouth, VII.1920, K. G. Blair, B.M.—2 L, 2 I, Fortrose, W. R. O. Grant, B.M.—2 L, nr. Glasgow, 1911, from pine stumps, Miss F. Collins, B.M.—3 L, 1 I, Scotland, B.M.—4 L, Germany: Brocken (Harz. Mts.), 11.VI.1922, under bark of spruce, K. Dorn, coll.E. 2409.

*Hargium inquisitor* L.—9 L, Aberdeen, VIII.1920, in bark of fallen pine, F. Laing, B.M.—2 L, Switzerland: Vissoye, G. C. Champion, B.M.—2 P, Germany: Hannover, K. Jordan, B.M.—6 L, Germany: Brocken (Harz Mts.), 11.VI.1922, under bark of

spruce, K. Dorn, coll.E.2408.—1 L, Germany: Gr.-Baum, Kreis Labiau, XII.1935, Korschefsky, coll.E.1765.

*Stenochorus meridianus* Panz.—The supposed larvae of this species in M.C. (see Meinert, 1893, Ent. Meddel., 4: 87) prove to be *Rhagium mordax* DeG. The characters in the key could thus only be taken from Perris (1887, Larves de Col.: 531-533). He described apparently this species (see Bedel, 1889, Fn. Col. Bassin Seine V, 1889—1901: 54, note 1) as *Oxymirus cursor* L., but did not mention the transverse suture of the frons in any species of Stenochorina. Some of the characters used in the key, are, thus, only hypothetical for this genus and *Acmaeops*.

*Grammoptera ruficornis* F.—3 L, 1 exuvia, 4 P, Germany: Zeyern, 11.IV.1922, K. Dorn, coll.E.479 and 2685 and B.M.

*Alosterna tabacicolor* DeG.—1 L, Denmark: Dyrehavn, 9.IX.1895, adult hatched 8.III.96, in bark of oak, E. Rosenberg, M.C.

*Strangalia quadrifasciata* L.—2 L, 1 P, Germany: Münden, 25.V.1892, wood of beech, K. Jordan, B.M. *S. maculata* Poda—1 L, New Forest, Easter 1918, adult hatched from other L 20.V.18., B.M.—1 L, Ranmore Common, 31.V.1930, from rotten oak branch on ground, K. G. Blair, B.M.—1 L, Lickey Hills, 1915, K. G. Blair, B.M.—1 L, Hut Wood, Southampton, 25.XI.1928, B.M.

*Leptura scutella* F.—1 L, Epping Forest, 26.III.1939, W. O. Steel, B.M.—2 L, Windsor Forest, from birch, H. Donisthorpe, B.M.—1 L, Windsor, 30.III.1938, H. Donisthorpe, B.M.—1 L, Epping Forest, 28.III.1939, H. Main, B.M.—1 L, 1 exuvia, 1 P, 1 I, Italy: Gennazano, in oak, Bergsoe leg., M.C. *L. rubra* F.—12 L, Germany: near Berlin, K. Eckstein, B.M.—1 L, 1 exuvia, 3 P, 6 I, Germany: Klingenberg on Main, VII.1938, from half-rotten stump of spruce, W. Döhler, coll.E.2903 *L. sanguinolenta* L.—6 L, 3 P, 1 I, Denmark: Nord Sjaelland, in fir-stump, M.C.—These larvae evidently belong to two different species. The three more extended specimens have the characters of *Leptura sanguinolenta* forma *b* in the key; the others have no sculptured plate on the cutting edge of the mandibles and are dealt with under *L. sanguinolenta* forma *a* in the key. In two of the latter the gular sutures are completely missing and the gula is not defined, whereas in the third specimen the gula is very well defined and the sutures raised. The specimen mentioned last has a length of only 11 mm. and was about to pupate. It can, therefore, only belong to a small species.

[*Oxymirus cursor* L.—1 L, Finnish Lapland: Alakneti, IX.1936, Jnr. Public Schools' Exp., B.M.—9 L, Germany: Harz

Mts., K. Jordan, B.M.—1 L, Germany: Wüstegiersdorf, near Waldenburg (Silesia), 15.IV.1917, coll.E.87.]

### 3. ASEMINAE.

*Criocephalus polonicus* Motsch. (= *ferus* Muls.).—2 L, Scilly Is., III.1924, J. Moore, B.M.—4 L, Scilly Is., O. J. S. Moore, B.M.—1 L, 1 P, New Forest, H. Willoughby Ellis, B.M.—2 L, no locality, coll.E.278 *C. rusticus* L.—1 L, England, B.M.—1 L, 3 P, 3 I, Hannover, from pine stumps, K. Jordan, B.M.

*Asemum striatum* L.—12 L, New Forest, XI.1934, from Corsican pine, H. F. Hanson, B.M.—1 L, Windsor, 10.VIII.1934, H. Donisthorpe, B.M.

*Tetropium gabrieli* Weise.—11 L, no locality, from larch, B.M.—2 L, Hendon, III.1926, from new fence (larch?), K. G. Blair, B.M.—3 L, 1 I, no locality, B.M.—[*T. castaneum* L.—2 L, Germany: Harz Mts., K. Jordan, B.M.—1 L, Germany: Brocken (Harz Mts.), 11.VI.1922, under bark of spruce, K. Dorn, coll.E.2410.—1 L, Germany: Gersdorf, near Kamenz (Saxony), 15.VII.1933, G. Schmidt, coll.E.2338; same locality, VII.1935, G. Schmidt, coll.E.1970.]

[*Spondylis buprestoides* L.—3 L, 1 I, Denmark: Tisvilde, VII.1905, J. C. Nielsen leg., M.C.—2 L, Germany: East Prussia, Zehlau-Bruch, 28.III.1921, in pine-stump, A. Dampf, coll.E.729 and B.M.]

[*Anisarthron barbipes* Schrk.—1 L, Morats, Reitter vendit, 1898, M.C.]

[*Saphanus piceus* Laich.—1 L, Germany: Meissen (Saxony), 4.IV.1923, from hazel, hatched by H. Wiessner, K. Dorn ded., coll.E.1063 (a second specimen with identical data proves to be *Leptura* sp.).]

### 4. CERAMBYCINAE.

*Cerambyx scopoli* L.—2 L, Germany: Münden, from apple-tree, K. Jordan, B.M.—6 L, 2 I, Germany: Klingenberg on Main, VI.1938, from apple-tree, W. Döhler, coll.E.2904.—12 L, France: La Garde-Monthieu (Charente inf.), B.M. *C. cerdo* L.—1 L, Germany: Leipzig, found in chopping firewood, O. Michalk, coll.E.1365.—num. L, Germany: Mörtitz, nr. Eilenburg, K. Dorn leg., det., ded., coll.E.2970 and B.M.

*Aromia moschata* L.—5 L, Wimbledon, 1898, B.M.—7 L, Wimbledon, 6.III.1899, F. W. Terry, B.M.—1 L, Liverpool, T. R. Eagles, B.M.—2 L, Germany: Schönebeck on Elbe, 19.VII.1924, in trunk of an old willow on the banks of the Elbe, C. Urban, coll.E.1479.

*Hylotrupes bajulus* L.—1 L, Greece: Lake Kopais, VII.1935, A. C. Whitmee, B.M.—7 L, Germany: nr. Berlin, K. Eckstein, B.M.—1 L, Germany: Leipzig, III.1923, in wood of an old insect-drawer, H. Dietze, coll.E.561.—3 L, Germany: Klingenberg on Main, III. and VI.1938, W. Döhler, coll.E.2905.

*Callidium violaceum* L.—7 L, Denmark: Copenhagen, IX. 1934, Ing. Christiani leg., M.C.—5 L, Germany: Bremen, 16.III. 1933, from rafters of a house, J. D. Alfken, coll.E.1078 and B.M.

*Pyrrhidium sanguineum* L.—1 L, 2 P, Hungaria, Reitt. vend. 1898, M.C.—I can hardly distinguish this larva from those of *Phymatodes testaceus*, though from the pupae associated with either species the identifications would seem to be correct. The single larva from Copenhagen has, however, somewhat longer and more slender antennae. This specimen, which is rather contracted, has only one transverse furrow of the dorsal abdominal ampullae, whereas the only contracted larva of *Phymatodes testaceus* presents two distinct furrows. In the extended larvae of this species, however, hardly a trace of the second furrow is usually seen. On the other hand, one specimen among the larvae from Wimbledon Common differs very markedly, the chitinised part of the genae being much wider, wider than the ocellar spot and the base of the antennae together and enclosing them; the cornea is indistinct. As I cannot suggest any other identification from the systematic characters of this specimen, it may either be an aberrant specimen of *Phymatodes testaceus* or the true larva of *Pyrrhidium*. The only unknown British larva in this group is *Phymatodes alni* L., which must of course be much smaller.

*Phymatodes testaceus* L.—1 L, London, in Natural History Museum, from oak, K. G. Blair, B.M.—2 L, Windsor, H. Donisthorpe, B.M.—5 L, 1 P, Wimbledon Common, 11.V.1893, B. G. Rye, B.M.—? 2 L, Vale, in case, B.M.—2 L, 1 I, Germany: Münden, 25.VI.1890, from oak (together with *Liopus nebulosus*), K. Jordan, B.M.—See remarks on foregoing species.

*Anaglyptus mysticus* L.—LL, 1 P, 1 I, Denmark: N. Sjaelland, from oak, M.C.

*Plagionotus arcuatus* L.—2 exuviae, Denmark: Copenhagen, from beech, Schlick, M.C.—1 L (poor), Germany: Münden, K. Jordan, B.M.

*Clytus arietis* L.—1 L, Stevenage, Herts., B.M.—1 L, Charnmouth, VII.1924, K. G. Blair, B.M.—2 L (poor), Trowbridge, Wilts., from birch, III.1920, Miss M. J. Barratt, B.M.—LL, Denmark: Barlöse, Rödel, VI.1903, A. Böving, M.C.—2 L, 1 P,

Italy: Mte. Baldo, 15.X.1936, from *Quercus robur*, A. Brasavola de Massa, coll.E.2887.

*Molorchus minor* L.—5 L, Windsor, V.1928, H. Donisthorpe, B.M.—1 L, Germany: Gersdorf, nr. Kamenz (Saxony), VII.1935 and 15.VII.1933, G. Schmidt, coll.E.1971 and 2339.

*Obrium cantharinum* L.—1 L, Sweden: Aelokarleby sorkan, Upland, 21.VIII.1938, from *Populus tremula*, Thure Palm leg., E. Rosenberg ded., coll.E.2858.

*Gracilia minuta* L.—1 L, 1 I, no data, B.M.—2 L, Germany: Munich?, ex coll. Verhoeff, B.M.—6 L, Germany: Halle on Saale, 6.X.1924, from willow-baskets, coll.E.2021.

[*Stromatium barbatum* L.—5 L, 1 I, London, 10.XI.1936, in wood of Indian tea-cases (see Emden, 1937, Bull.Ent. Res. 28:321), adult bred from the same material in autumn 1938, B.M.—3 L, 1 I, Glasgow, 13.X.1928, D. Ellis, B.M.]

[*Eburia quadrigeminata* Say.—1 L, London, from cabinet of American oak, 22.VIII.1935, B.M.]

[*Neoclytus acuminatus* F.—1 L, Italy: Avio (Trento), 19.X.1930, from *Prunus cerasus*, A. Brasavola de Massa, coll. E.2894.]

## 5. LAMIINAE.

*Pogonochaerus hispidulus* Pill.—2 L, Somerset, Kilve, K. G. Blair, B.M. *P. hispidus* L.—1 L, Germany: Münden, apple-tree, together with *Scolytus rugulosus* Ratz., K. Jordan, B.M.

*Mesosa nebulosa* F.—1 L, Hut Wood, Southampton, 25.XI.1928, H. Donisthorpe, B.M.—14 L, Germany: Münden, in beech-tree, K. Jordan, B.M.—2 L, same locality, under bark of beech (together with larvae of *Leiopus nebulosus*), K. Jordan, B.M. [*M. curculionoides* L. 2 L, 1 P, Italy: Avio, Trento, 20.IX.1920, from *Juglans regia*, A. Brasavola de Massa, coll.E.2890.]

*Agapanthia villosoviridescens* DeG.—1 L, Germany: Leipzig, Connewitzer Holz, 13.XI.1921, from stalk of *Urtica dioica*, A. Schulze, coll.E.380. [*A. asphodeli* Latr. 1 L, S. France?, 8.VI.1901, from *Asphodelus*, Dr. Chapman, B.M.]

*Leiopus nebulosus* F. 1 L, Amersham, IV.1923, K. G. Blair, B.M.—4 L, Wimbledon Common, under bark, 27.II.1912.—2 L, Windsor Forest, 14.IV.1939, H. Donisthorpe.—4 L, New Forest, Easter 1918, adult emerged 25.V.18, K. G. Blair, B.M.—1 L, Hendon, 14.XII.1919, from elm twigs, B.M.—1 L, no locality (British), 16.V.1936, T. R. Eagles, B.M.—6 P, no data (British), B. G. Rye, B.M.—4 L, 2 P, 1 I, Germany: Münden, K. Jordan, B.M.—1 L, same locality, among larvae of *Cerambyx scopolii* L.,

K. Jordan, B.M. — 1 L, same locality, 3.IV.1892, among larvae of *Callidium* sp, K. Jordan, B.M. — 1 L, Germany: Hildesheim, K. Jordan, B.M. — 2 L, Germany: Berlin-Grunewald, III.1936, under bark of oak, Korschefsky, coll.E.1778.

*Monochamus sartor* L. — 2 L, Denmark: Copenhagen, Gericke, S., M.C. M. sp. 2 L, in telegraph poles from Sweden (*Pinus sylvestris*), B.M. — 1 L, no data, IV.1918, B.M. — 1 L, Burton-on-Trent, in foreign timber (deal) for ceiling rafter, I.1935, C. Lacey, B.M.

*Acanthocinus aedilis* L. — 1 L, Germany: Dübener Heide, 17.VII.1921, under bark of *Pinus*-stump, H. Dietze, coll.E.415. — 8 L, Germany: Mosigkauer Heide, 19.V.1921, under bark of stumps, coll.E.221, and B.M.

*Stenostola ferrea* Schrank. — 8 L, 2 I, Hald-Lund, S., M.C. — This is the material studied by Schiödt (1876, Nat. Tidskr. (3) 10: 439-440, t. 18, f. 17-18; see Meinert, 1893, Ent. Meddel. 4: 94). It contains two different species: four specimens with very fine abdominal asperities, which are *Saperda scalaris* L., and four specimens which are very similar to *Saperda populnea*, though definitely distinct, as shown in the key. Unfortunately, Schiödt overlooked the fact that his material was mixed and that the largest of the larvae (24 mm.) was considerably larger than might be expected from the adult, and he described and figured the largest specimens, belonging to *Saperda scalaris*. The second species, contained in Schiödt's material, no doubt is really *Stenostola ferrea* and presents the characters described by Kemner from specimens collected and reared by Mr. E. Rosenberg of Copenhagen. — 1 L, Germany: Münden, 2.I.1891, apple-tree, among larvae of *Sap. scalaris*, K. Jordan, B.M.

*Saperda carcharias* L. — 1 L, Britain, 1872, B.M. *S. populnea* L. 1 L (beetles reared), Bookham, from willow, 18.I.1930, C. N. Hawkins, B.M. — 1 L, Wimbledon Common, from aspen, 16.I.1930, C. N. Hawkins, B.M. — 1 L, Stanmore, K. G. Blair, B.M. — 1 L, British Isles, B.M. — 2 L, Germany: Münden, 20.III.1892, K. Jordan, B.M. — 5 L, 1 P, same locality, K. Jordan, B.M. *S. scalaris* L. 6 L, Germany, Münden, 2.I.1891, apple-tree, K. Jordan, B.M. — 1 L, Leipzig, Burgau, 22.I.1922, from oak, K. Dorn, coll.E.418. — 1 L, Buchholz-Otterwisch nr. Leipzig, 31.X.1925, under bark of a dead birch-tree, C. Michalk, coll.E.1870. — 1 L, Berlin-Grunewald, III.1936, under bark of oak, Korschefsky, coll.E.1777. — 2 L, Leipzig-Kleinzschocher, 1.V.1922, from elder, coll.E.694. — 1 L, Klingenberg on Main, W. Döhler, coll.E.2902.

[*S. perforata* Pall. 2 L, Germany : Erfurt, XII.1930-I.1931, from *Populus tremula*, E. Lehmann (see Merseburger Land, 30, 1936, pp. 1-6), coll.E.841.]

*Oberea*. No larvae of *O. oculata* L. are available, but the characters should essentially be the same as those in the key, which refer to [*O. linearis* F. — 3 L, Denmark : Rörvig, VII.1902, J. E. Nielsen, M.C.].

[*Diaxenes dendrobii* Gah. — 1 L, Bush Hill Park Nursery, Middlesex, 12.I.1899, from a pseudobulb of *Dendrobium wardianum* from Burma, B.M. — 2 L, 2 P, France : Paris, X.1894, from *Dendrobium nobile*, B.M.]

[*Dorcadion* sp.—4 L, Turkey : Ushak, in beet-fields, P. Steiner, coll.E.2310 and B.M.]

[*Moneilema* sp. — 1 L, Germany : Bremen, VII.1930, from *Astrophytum* sp., J. D. Alfken, coll.E.830.]

Imperial Institute of Entomology,

British Museum (Nat. Hist.),

London, S.W.7.

September 15th, 1939.

## Review.

'PRINCIPLES OF FOREST ENTOMOLOGY.' By S. A. GRAHAM. 2nd Edition, 8vo, pp. xvi + 410, 165 figs. McGraw-Hill Publishing Co. Ltd., London. 1939. Price 26s. 3d.

The first edition of this book, published some ten years ago, marked a new departure in American forest entomology. For the first time the study of forest insects was placed upon an ecological basis, as it was recognised that the study of an insect organism in relation to the forest means not only investigating the insect organism itself, but also its relations to the environment in which it lives. This second edition, somewhat enlarged and broadened in scope, marks a great advance on its predecessor, although the general plan of the book is left unchanged. The author, beginning with two chapters on the history and literature of forest entomology and the general scope of its work, proceeds in the next three to deal with the laws governing insect multiplication in forests, and the effects of environmental factors on their increase or reduction. These are headed 'Biotic Potential,' 'Environmental Resistance,' and 'Insect Abundance' respectively, and it is here that the reader will discover the basic principles which underlie the study of all forest insect problems. An understanding of these principles is prerequisite to the study of the rest of the book. Following upon these are four chapters dealing with all forms of insect control in forest operations. The most up-to-date researches of the past decade are discussed, and amongst other things the reader will find an illuminating account of the methods now employed in the Western States to control the bark-beetle hordes which devastate the coniferous forests. In the six chapters which follow the author selects important insect types attacking different parts of the tree such as the leaves, buds, cambial region, wood, etc., dealing in two further chapters with the insect parasites and predators which attack these pests. The final chapter



is devoted to the study of the indirect effects of forest insect damage, such as the incidence of fungus disease and the carriage by insects of virus infections. The book ends with a glimpse into the future, in which the author calls for an alliance between the forest entomologist and the forester to resist the insect aggressions of the years to come. The book will be eagerly welcomed by all foresters and students of forest entomology in America. Its scope is not by any means limited to that continent. It is written in English, and foresters in all lands will find much to interest and instruct them in its pages.—R. N. CHRYSTAL.

**CORYMBITES ANGUSTULUS KIES.: AN ELATERID NEW TO THE  
LIST OF BRITISH COLEOPTERA.**

BY J. HIGNETT.

For several years I have taken an Elaterid in some numbers by sweeping the mixed herbage on the banks of the River Vyrnwy in the Melverley district of Shropshire.

Failing to identify it with any of the British species of this family, I sent examples to Mr. H. Donisthorpe, who, with his usual kindness, has identified it as *C. angustulus* and has supplied the following translation of the original description and particulars of its distribution:—

*Corymbites angustulus* Kiesenwetter in Erichson.

1863, Nat. Ins. Deutschl., 4: 291.

‘At first sight similar to *Limonijs parvulus*, black, somewhat metallic and on account of a yellowish shimmering pubescence inclining towards greenish. Head feebly arched, forehead with flat impressions strongly and closely punctured, frontal margin on each side sharply and in the middle slightly depressed; eyes large and somewhat prominent. Antennae thin, not very serrate, longer than head and thorax, 3rd joint twice as long as 2nd, and slightly longer but narrower than 4th. Thorax cushion-shaped, very slightly arched, much longer than broad, distinctly narrowed anteriorly and here hardly broader than head with the eyes, the straight sides slightly narrowed before the middle, the sharp posterior angles pointing outwards, somewhat finely and sparsely punctured, more closely at the posterior angles. Posterior angles usually with a not very distinct longitudinal keel. The elytra broader and about two and a half times as long as thorax, its greatest breadth at or a little behind middle, long, oval, with punctured striae, the interstices rugosely punctured, clothed with short gold-shimmering hairs. Legs lighter or darker testaceous with reddish-yellow tibiae and tarsi. The latter, especially the hind pair, strongly and narrowly elongate.’ Long. 3 lin.

Belongs to the genus *Corymbites* of the *Limonijs*-form, as does *C. quercus* of the *Agriotes*-type.

On the Continent it is found in Switzerland, Germany and France.

This beetle may be mixed with *C. quercus* in collections, but its yellow tarsi should enable anyone to recognise it at once, *quercus* having black tarsi.

Oak Street, Oswestry.

November 16th, 1939.

NOTES ON SOME ICHNEUMONID AND FIGITID (HYM.)  
PARASITES OF NEUROPTERA.

BY G. J. KERRICH, M.A.

Killington (1933) gives a record of a Chalcidoid parasite bred by Mr. H. Britten from cocoons of *Kimminsia subnebulosa* Steph. (Hemerobiidae) taken at Romiley, Cheshire, in 1926. On May 13th, 1939, Mr. Britten took me to the same sycamore tree, where more *Kimminsia* cocoons were found. From these were bred a single male of the host and the following parasites: *Hemiteles hemerobii* Pfank. (Ichneumonidae) and two species of *Aegilips* (Figitidae). Notes on *Anacharis* spp. (Figitidae) are appended.

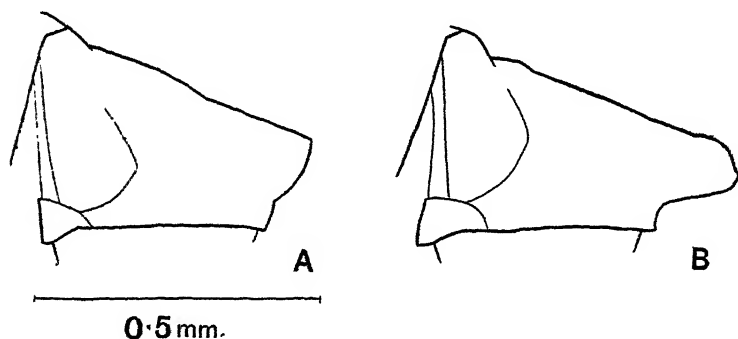
Dr. Killington has confirmed Mr. Britten's determination of a male host from his original breeding as *K. subnebulosa* (Steph.), and my provisional determination of the host insect bred by myself as *K. betulina* (Strøm) (*Hemerobius nervosus* Fabr.). He writes that it is quite likely that *K. betulina* and *subnebulosa* would be obtained from a single tree, but that it is not possible to determine species with any degree of accuracy from cocoons and larval or pupal exuviae. He has, however, examined several of the cocoons concerned, and believes them to be of *Kimminsia* species.

*Hemiteles hemerobii* Pfank. — This is believed to be the first British record of this species under this name, but I am unwilling to state positively that it is different from the inadequately described *pullator* Grav. In the shape of the head, which is strongly narrowed behind the eyes, and in the distinctly excised scape it differs from the characters given for the species-group in which Thomson (1884) placed *rubripes* Thoms., recorded by Killington from *Wesmaelius quadrifasciatus* Reut.; and it is abundantly distinct from *Brachycephalus aestivalis* Grav. Two males (one doubtful) and four females were bred, emerging as follows: ♀, 18.v; ♂, 25.v; ♂, 27.v; ♀, 29.v; ♀, 5-6.vi; ♀, 6-7.vi. This species spins a whitish or pale brownish cocoon within that of its host: all the above had done so when first observed except the last-mentioned female. This was observed on about May 18th as a small larva feeding on the host pupa: it grew rapidly, and spun up on about May 25th. Mr. Britten subsequently collected more *Kimminsia* cocoons in the Goyt Valley, Cheshire, and two males of *Hemiteles hemerobii* Pfank. emerged on June 9th.

*Aegilips dalmani* Reinh. — One female emerged 1-4.vi.

*Ae. ? rugicollis* Reinh. — One female emerged 18.v., one male 22.v.

These two species pupated within the host cocoon without spinning cocoons of their own, as observed by Miles (1924) in the related *Anacharis ensifera* Walk. Typical examples of these two species are readily separable upon the characters given in Dalla Torre and Kieffer's monograph (1910), but I agree with Cameron (1890, p. 183) in finding a tendency towards an intermediate condition: I find, however, a distinct difference in the shape of the scutellum, especially as seen in side view, in which that of *rugicollis* appears much more elongate and sharply pointed (fig.). This difference is much



Figs. A-B.—Figure of scutellum in side view; drawn with the aid of a binocular microscope, squared eye-piece and graph-paper. A, *Aegilips dalmani* Reinh.; B, *Ae. ? rugicollis* Reinh.

greater than the variation to which *dalmani* seems normally subject. From Cameron's figures, the scutellum appears to resemble in shape that of *Xyalaspis subulifera* Thoms., though not that of *armata* Giraud, but this species does not appear to agree with the description of any species placed in *Xyalaspis*. Among Mr. Britten's original material from Romiley are three females of *Ae. ? rugicollis* labelled 'em. 1926, sycamore bark with *Hemerobius*,' and Mr. Britten has a further male from Gatley, Cheshire, em. 3.iii.1929 from a neuropterous cocoon in a hogweed stem. This latter cocoon Dr. Killington believes to be of *Hemerobius* sp. This is not the same species as that recorded by me from Cambridgeshire (1938) as *Ae. rugicollis* ? var. *subsessilis* Kieff., which, from the description given, should be a good species.

*Anacharis* spp. From the Goyt Valley, Cheshire, Mr. Britten has bred from *K. subnebulosa* (Steph.) a male that is possibly *immunis* Walk., em. 6.vi.1939. Among his original Romiley material are two female specimens of *typica* Walk., em. 30.iii.1926, labelled

'? parasite on *Boriomyia subnebulosa* Steph.' From the Romiley tree I took a female pupa of *A. ? rufiventris* Hart., but it appeared to be lying naked under the bark and not within a neuropterous cocoon.

I wish to thank Mr. Britten, Dr. Killington and Dr. Miles for reading my manuscript, and especially Dr. Killington for the help acknowledged above.

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Manchester Museum,

Manchester, 13.

November 7th, 1939.

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*Dumfriesshire Sawflies.*—In this magazine for 1933 (*Ent. Mon. Mag.*, 69: 203-4, 256) appear two notes from me enumerating ninety-one species of sawflies from the county of Dumfriesshire. Since then I have met with the following twenty-nine additional species. *Tenthredella velox* Fab., one specimen swept on Newton Moss, 6.vii. *Allantus scrophulariae* Lin., odd specimens taken in a derelict garden near Springfield in late June and early July. *Dolerus liogaster* Th., one beaten from *Ulex* growing on a hedge bank, 27.iv, and another swept on Newton Moss, 28.v. *D. niger* Lin., a female taken on Nutberry Moss, 9.vii. *Athalia scutellariae* Cam., two swept in a lane near Springfield, 4.v and 27.vi. *A. bicolor* Lep., five occurred to me in my garden on various dates in June and is probably common. *A. cordata* Lep., common generally from June to August. *Selandria flavens* Kl., one from Newton Moss, 14.vi. *Emphytus tener* Fall., one from hedge bank near Gretna, 23.v. *Caliroa limacina* Retz., apparently rare here. I swept one on Newton Moss, 16.vii. *Phyllotoma vagans* Fall., Nutberry Moss in August. A pair swept from under an alder hedge. *Pelmatopus fuscus* Kl., one, Newton Moss, 14.v. *Bleinnocampa affinis* Fall., a pair swept in a farm lane, 24.v. *B. tenuicornis* Kl., scarce; I swept one on the banks of the Black Sark burn, 23.vi.36, and another at the same place, 23.vi.39. *Scolio-neura betuleti* Kl., beaten from birch on Newton Moss, 23.viii. *Mesoneura opaca* Fab., scarce, swept from under oak trees in Quentins Hill Wood in May. *Platycampus luridiventris* Fall., Raeburn Flow and other moors where alder grows, in June. *Trichiocampus ulmi* Lin., scarce, a female near Springfield in May. *Pontania leucapsis* Tisch., several on Newton Moss in June. *Priophorus tener* Zadd., Newton Moss, 11.vi, rare. *Nematinus bilineatus* Kl., a single specimen

is referred to this species by Dr. R. C. L. Perkins, swept from roadside herbage, 21.v. *N. acuminatus* Th., again only one specimen, Newton Moss, among birches, 7.vi. *Pteronidea polyspila* Först., one from Nutberry Moss, near a small burn, on 17.viii. *Pachynematus obductus* Hart., several swept from long grass on Raeburn Flow in June. *Pristiphora pallidiventrif* Fall., met with several times on Newton Moss in June. *Arge fuscipes* Fall., Newton Moss, 8.vi, swept from *Lastrea*, and Springfield, 27.v, also from ferns. *Pamphilus vafer* Lin., rare; I caught one beside a mixed wood on Nutberry Moss, 9.vii.36. *Cephus pallipes* Kl., odd specimens swept in June by sides of burns. *Sirex gigas* Lin., common at Eastriggs in August, 1938, probably from imported timber. I caught one and saw another near Lockerbie, 2.viii.37. Specimens of most of these have been examined by Dr. R. C. L. Perkins, and the names are as in his 'Sawflies of Devonshire' (1929, *Trans. Devons. Ass. Adv. Sci.*, 61: 281-310). —JAS. MURRAY, 6 Burnside Road, Gretna, Dumfriesshire: December 2nd, 1939.

#### A NEW BRITISH SPECIES OF THE GENUS *NEOASCIA* WILLISTON (DIPT., SYRPHIDAE).

BY R. L. COE.

While checking the determinations of Syrphidae included in the collection of the late J. J. F. X. King, I noticed above the name-label of *Neoascia podagrica* Fabricius five females which showed marked differences from that species. Four were taken at Gorge of Avon, Lanarkshire, 20.v.1905, and one at Erskine, Renfrewshire, 14.vi.1906. Further search among the long series of *podagrica* brought to light three males from Gorge of Avon, 17.v.1905, which likewise differed, and an examination of the genitalia confirmed my impression of the discovery of a new British species of *Neoascia*. Mr. J. E. Collin, to whom I communicated a brief description of the species, has since discovered among some old duplicates of *podagrica* a further example of the male, taken by Mr. G. H. Verrall 'nr. Darenth,' Kent, on May 2nd, 1868. Thus, as Mr. Collin remarks, the species certainly occurred in the south of England seventy-one years ago. Like *podagrica*, which it closely resembles, the new species differs from our other British *Neoascia* in having the cross-veins of the wings darkened and the third antennal segment at least twice as long as broad. It may be distinguished from *podagrica* as follows:—

#### *Neoascia obliqua* sp.n., ♂ ♀.

♂. Frons less shining and less sparsely punctate on upper half. Second abdominal tergite with oblique yellow side-stripes, which extend broadly along the side margins, but narrow gradually as they slope forward towards the middle of disc, where they are separated by the blackish ground-colour. The straight yellow band at middle of corresponding tergite in *podagrica* is occasionally incised at the centre or even divided, and in such cases it is useful to note that along the side-margins the side-stripes in *obliqua* extend nearer to the hind

corners of the segment than does the yellow band in *podagrica*. Yellow band on third tergite broader than in normal *podagrica*, and there is a greater tendency for a dark spot to occur in the middle towards the anterior margin, with which it may connect. Hind femora slightly less swollen. Wings with marginal cross-veins exhibiting an even greater tendency to be angled below, where an appendix is frequently present. Genitalia (Fig. 1) differing obviously from those of *podagrica* in the size and shape of the styles (the paired appendages of the tenth tergite). These are of moderate size in *obliqua* (Fig. 2), with the dorsal lobe gently rounded and considerably larger than the apical one. In *podagrica* (Fig. 3) the styles are very small, with the dorsal lobe almost rectangular and not more than twice the size of the apical one.

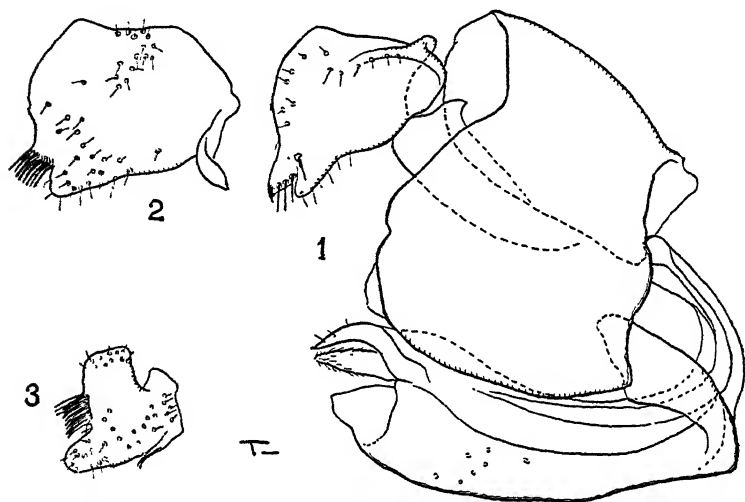


FIG. 1.—*Neoascia obliqua* sp.n. Genitalia in profile (left style and anal cerci removed).

„ 2.—*N. obliqua* sp.n. Left genital style, external view.

„ 3.—*N. podagrica* Fabricius. Ditto.

♀. Frons as in male, except that the depression on lower half extends narrowly down the centre, occupying less than one-third of width. In male *obliqua* and both sexes of *podagrica* the depression is roughly circular, longitudinally furrowed, often with golden reflections, and occupies major width of frons. Second abdominal tergite as in male. As in female *podagrica*, the yellow band on the third tergite may be completely divided, or else narrowly connected at its anterior margin. It differs, however, in being deeper, with the incision at middle narrower and more rounded anteriorly, and is more extensively cut away at its front corners, so that only a narrow yellow strip connects with the side-margins. The fifth tergite lacks the two or four peculiar long, stout, upstanding white hairs which occur on the extreme tip of the disc in female *podagrica*. Hind femora and wings as in male.

British Museum (Natural History),

London, S.W.7.

December 1st, 1939.

*PHILONTHUS SEMUNCIARIUS* SP.N. (COL., STAPHYLINIDAE).

BY THE REV. C. E. TOTTENHAM, M.A., F.R.E.S.

A species very closely allied to *Philonthus varians* Paykull. Black, shining, with a slight dark metallic lustre on the elytra. Antennae, palpi and legs, including coxae, black or blackish.

*Head* orbicular, as long as broad; much rounded in front, sides rounded, straighter behind the eyes; posterior angles marked, obtuse; base and neck broad, base concave. Eyes considerably longer than the sides of the head behind (20 : 13). Median pair of interocular punctures small and adjacent to the larger exterior pair near the inner margin of the eyes; five other moderate punctures in the post-ocular region. Ground sculpture very close and fine, transverse. *Maxillary palpi* with the terminal segment nearly twice as long as the penultimate. *Antennae* long, fully as long as head and thorax; third segment half as long again as the second; fourth to sixth subequal, scarcely shorter than the second; fifth to tenth gradually decreasing in length, tenth about three-quarters the length of the fourth; eleventh as long as the second: all the segments distinctly longer than broad. *Thorax* wider than head, just a little longer than broad (13 : 12), very strongly widened behind; apex truncate, anterior angles obtuse, sides nearly straight, posterior angles rounded together with the base; dorsal series each consisting of five punctures (sensu Erichson), of which the first and fifth are more remotely placed than the others; lateral series of three punctures, parallel to the dorsal series; two other punctures towards anterior angles, and several distinct marginal punctures; ground sculpture similar to that of head. *Scutellum* moderately punctured throughout. *Elytra* at base a little broader than thorax, widened behind, jointly wider than long; puncturation close, moderate and even; surface smooth; pubescence short, pale, scanty. *Abdomen* very finely punctate, closely at the bases of the segments, sparingly at the apices.

Male.—Anterior tarsi dilated; last ventral segment rather deeply, narrowly, triangularly excised; aedeagus with the median lobe long, narrow and pointed, and with the paramere a little widened in the apical half and very bluntly pointed at apex, the pegs being numerous, regular and arranged marginally, but incurving at their basal extremity to form an ellipse (figs. 1—3).

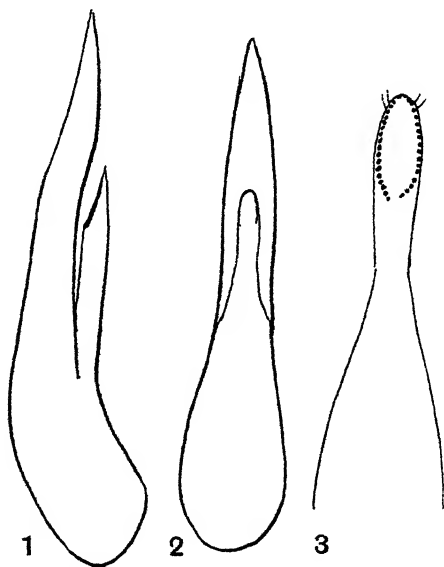
COSTA RICA?\*: El Congo, 750 m., 20.vii.1933 (H. Paez).

Type and paratypes in my collection.

This species in aedeagal character is near to *Philonthus varians* Paykull, although superficially it more closely resembles *P. longicornis* Stephens. From *variens* ab. *unicolor* Steph. it may be distinguished by its black anterior coxae, longer antennae, marked posterior angles of the head, much longer thorax, smoother elytra with larger and more diffuse puncturation, more diffusely and finely punctured abdomen, and by the aedeagus. In the aedeagus the median lobe is much longer, extending fully twice the length of the pegged portion of the paramere beyond the apex of the latter, whereas in *variens* it extends less than this portion; viewed

\* I have been unable to trace this locality on any maps, but believe it is in Costa Rica, especially as Mr. Nevermann in an accompanying letter said he was sending me some Staphylinidae from that country.

laterally the pegged apex of the paramere is shorter and less distinct; the inner face of the paramere is similar to that of *varians* in outline (cf. 1937, *Ent. Mon. Mag.*, 73: 177, figs. 2, 4, 6), but the pegs are arranged differently. The punctuation of the elytra



FIGS. 1—3. *Philonthus semunciarius* n.sp. 1, aedeagus, dorsal aspect; 2, aedeagus, viewed from the left; 3, paramere, inner face.

is more like that of *longicornis* Stephens, from which *semunciarius* can readily be distinguished by the colour of the legs, the shape of head and thorax, the fine punctuation of the abdomen, and above all by the symmetrical aedeagus. From *P. jurgans* Tottenham, which it resembles in having dark coxae, it differs in the same respects as it differs from *varians* Paykull.

88 Station Avenue,

West Ewell, Surrey.

September 16th, 1939.

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*Hemerobius marginatus* Stephens (Neuroptera) in the Isle of South Uist.—In a previous publication (*Scot. Nat.*, 1938: 29), I recorded no fewer than eight species of Hemerobiidae from the Islands of Raasay, South Rona, Scalpay, and Pabbay in the Inner Hebrides. However, at that time I had never encountered any species of the group in the Outer Islands, nor had I noticed any records of their occurrence in the literature. Nevertheless, in August this year, whilst beating for larvae in a beautiful little birch, hazel, aspen and mountain ash



wood lying along the Allt Volagir, South Uist, I knocked several examples of *Hemerobius marginatus* Stephens from *Betula pubescens* Ehrh. and *Corylus Avellana* L. It is interesting to note that this species does not find a place in my Raasay list.—J. W. HESLOP HARRISON, King's College (University of Durham), Newcastle-upon-Tyne: October 30th, 1939.

*Lixus paraplecticus* L. (Col., Curculionidae) in Kent.—When examining flood refuse along the towpath of the River Medway, near Maidstone, on the afternoon of Wednesday, April 5th, 1939, immediately after the exceptionally high spring tide, one male specimen of *Lixus paraplecticus* L. was found walking slowly on the mud. A week later twelve more specimens were found after a diligent search. A further visit was made to the locality at the end of August, when the *Lixus* was found in profusion. The species appears to be gregarious, and was in each instance associated with its host plant, *Sium latifolium* L. This appears to be a new record for the county, since it is not recorded in the Victoria County History of Kent, and it is not mentioned in the late Commander J. J. Walker's faunal lists of the Isle of Sheppey (1932, *Trans. Ent. Soc. S. Engl.*, 7: 81-140) and of the Rochester district (1897-1900, *Rochester Nat.*, 2: 441-650).—A. M. MASSEE, East Malling Research Station, Maidstone, Kent: November 6th, 1939.

*Volucella inanis* L. (Dipt., Syrphidae) in Sussex.—On August 25th, 1939, I captured a perfect specimen of *Volucella inanis* L. which was busily feeding on the umbels of a species of water dropwort growing near a stream at Waldron, East Sussex. This is the second example of this fine fly that has come my way. It is, however, rather smaller than the previous specimen, which was taken feeding on elder flowers in a small wood at Hastings on June 26th, 1934. As far as I have been able to ascertain, the only other records of this fly in Sussex were at Three Bridges and Guestling, the former by G. H. Verrall and the latter by E. N. Bloomfield.—A. E. MOON, The Furnace, Horam, East Sussex: November 7th, 1939.

*Melanic form of Elater sanguinolentus* Schr. (Col., Elateridae).—Charles Gulliver was so good as to lead me on June 8th, 1934, to a locality in the New Forest where this beetle is annually gregarious; elsewhere I have found it but singly in the last forty years. Between then and 25th I beat a long series from old gorse-bushes, on the last day along with them a single totally black male *Elater*. This specimen I considered to be a melanic form of the species in question, possibly the same as the normally alpine *E. aethiops* recorded from Windsor by Thomas Desvignes, Charles Turner and, so recently as 1925, 1927 and 1935, Mr. Donisthorpe.\* Mr. Bedwell, however, thought it *E. nigerimus* Lac., despite its length of 11 mm.; and on October 24th last took it to the British Museum, where he, together with Mr. Donisthorpe and Dr. Blair, agreed that it was not that species; it is much larger and relatively longer than any such contained there. On the 26th Dr. Blair returned it to me with his opinion: 'I think you are right and that it is a variety of *E. sanguinolentus*, but I can find no mention of such a var. in literature; we have none like it in the Museum.' The type-form alone again occurred to me at the same spot in June, 1936 (*Trans. Suffolk Nat. Soc.*, 3: 185) and 1938. The specimen has now been placed in the National Collection.—CLAUDE MORLEY, Monks Soham House, Framlingham, Suffolk: November 5th, 1939.

[i.e. *nigerimus* Lac.: *E. aethiops* Lac., though about the same size, has the thorax dull, closely and coarsely punctate.—K.G.B.]

A REPORT ON A COLLECTION OF CERATOPOGONIDAE (DIPTERA)  
FROM BRITISH GUIANA.

BY J. W. S. MACFIE.

The collection consists of 167 specimens, all collected by Mr. C. A. Hudson on the New River, British Guiana, at an altitude of 750 ft., during the months of February and March, 1938.

The majority of the specimens (112) are *Culicoides*, and they are distributed among eight different species of which five appear to be new. In addition, eleven other species are represented, which belong to seven different genera, namely two *Paryphoconus*, three *Forcipomyia*, two *Atrichopogon*, one *Acanthohelea*, one *Monohalea*, one *Bezzia* (? *Parrotia*) and one *Bezzia* (*Homobezzia*). Of these five appear to be new.

The method of description is that which I have used in a number of recent reports. The unit used is approximately  $3.6\mu$ . The types of all the new species described are in the collection of the British Museum.

*Paryphoconus nigripes* Macfie (3 ♀ ♀).

*Paryphoconus subflavus* sp.n. (3 ♀ ♀).

This species resembles closely *P. nubifer* Macfie, a species found in Brazil, and may be only a pale variety of it. The description given of *P. nubifer* may be taken as applying to this insect also excepting in the following particulars:—

*Head* with torus yellowish-brown. [Rest of antennae missing from all three specimens.] *Thorax* paler, mainly yellowish-brown, but very dark brown posteriorly just anterior to scutellum. Anterior tubercle with sharp point. *Wings* paler, the brown cloud at tip less dense and rather larger, extending towards base a little beyond level of end of costa. Veins paler, almost colourless, only distal half of costa, end of  $R_{4+5}$ , and cross-vein brown. Halteres with whitish knobs. *Legs* with terminal segments of tarsi red-brown rather than dark brown; fourth segment cordiform. T.R. in the individual measured about 2.3. *Abdomen* with segments 1—3 and tip blackish, segments 4—6 more yellowish-brown, each with tergite dark brown but with a semicircular excavation anteriorly. Gland rods very long, extending almost to base of body. Spermatheca in the individual measured, almost spherical, diameter about  $65\mu$ , with duct chitinised for a short distance, about  $7\mu$ .

*Forcipomyia raleighi* Macfie (1 ♂).

The specimen was examined in the dry condition only.

*Forcipomyia inornatipennis* (Aust.) (1 ♂, 2 ♀ ♀).

The male lacks the hypopygium. The determination therefore lacks confirmation.

***Forcipomyia flavifemoris* sp.n. (10 ♂♂, 6 ♀♀).**

A brown but not blackish species, bearing broad scales, with the wings adorned with a single, rather large, pale area about the middle of the anterior border, the hind femora dark brown at ends but yellowish in middle, and the T.R. about 1.

♂, ♀. Length of wing 1.4–1.6 mm., greatest breadth about 0.9 mm.

*Head* very dark brown, bristly. Palpi dark brown, third segment inflated towards base, with small shallow pit; lengths of last three segments in both sexes about 22, 10 and 11 units respectively. Antennae of male darkish brown at base and apex, yellowish in middle, with ample plume; segments 4–11 ranging from about 19 by 18 to 20 by 10 units; 12–14 elongate, their lengths in one specimen about 53, 40 and 35 units respectively; 15 about 37 (including nipple-like stylet of about 3 units) by 7 units. Antennae in female dark brown at base, pale brown distally; segments 4–10 flask-shaped, sub-equal, about 19 by 10–11 (maximum) units; 11–14 only slightly longer, not flask-shaped, sub-equal, 20–23 by 9 (maximum) units; 15 about 30 (including nipple-like stylet of about 3 units) by 7–8 units. The combined lengths of segments 3–10, 4–10 and 11–15 about 153, 133 and 117 units respectively. *Thorax* rather dark brown with traces of usual adornment; in male paler than in female with more distinct adornment. Clothing of bristles and hairs dense. Scutellum rather dark brown. *Wings* adorned with a rather large pale spot just beyond end of costa; bearing numerous scales. In male wings mainly pale, but with deep dark patch over radial area, and another darkish patch near anterior margin about midway between end of costa and tip. There is also infuscation along Cu<sub>2</sub>. In female wings darker, especially radial areas. Fringe long, the lanceolate hairs in it apparently not fringed. Venation normal. Costa extending about half length of wing. First radial cell obliterated, second small, triangular. Fork of Cu in both sexes at about same level as end of costa. Halteres with whitish knobs. *Legs* banded, bearing numerous broad scales in addition to bristles and hairs in both sexes. No modified tibial spines. All knees yellowish. Hind legs with femora narrowly dark brown at both base and apex, yellowish in middle; tibiae with two dark brown bands of approximately equal width. Four anterior legs somewhat similarly adorned, but femora paler, entirely yellowish (fore legs) or with narrow dark brown band at base only (middle legs). First four tarsal segments dark brown in middle, but articulations and fifth segments yellowish. T.R. in both sexes 0.9–1.0. *Abdomen* darkish brown in female; paler in male, especially at base. Scales abundant, broad, striated. Spermathecae 2, very highly chitinised, obovate, rather unequal, total length and greatest breadth in one specimen about 82μ by 50μ and 68μ by 44μ respectively. Hypopygium dark brown at base and apex, yellowish in middle. Ninth segment with tergite of usual form, with abundant scales, and strong bristles especially along periphery; sternite not, or only slightly, excavated in middle line posteriorly, bearing numerous bristles. Side-pieces large, subreniform, apical half dark and basal half yellowish, with abundant very strong and long bristles; claspers relatively small, narrow, much as in *F. ornatipennis*. Harpes and aedeagus much as in *F. ornatipennis*.

This species may be distinguished from *F. argenteola* Macfie, which also bears numerous broad scales and has a single, but smaller, pale spot on the wing, by the adornment of the legs, the

tibiae having two dark brown and two yellowish bands instead of being mainly yellowish-brown with the base infuscated. Specimens in which the wings are denuded and the pale spot in consequence obscured might be confused with *F. lacrimatorii* Macfie or one of the allied species, but in all of them the hind femora are entirely or mainly dark brown.

*Atrichopogon flumineus* Macfie (3 ♀ ♀).

*Atrichopogon* sp. near *pallidipes* K. (1 ♀).

The specimen is damaged, without antennae.

*Atrichopogon* spp. (2 ♂ ♂).

These two males are not alike, and show no very characteristic features. They are therefore not described. They may be associated with the females found in the collection, but with equal probability they may not.

*Culicoides guttatus* Coq. (*C. diabolicus* Hoff.) (6 ♂ ♂, 39 ♀ ♀).

*Culicoides indianus* Macfie (1 ♀).

This specimen does not seem to differ to any significant degree from those taken in India for which I proposed (1932) the name *C. indianus*, but further material is necessary to confirm the diagnosis. The radial cells in this individual are confluent on one wing, narrowly separated on the other.

*Culicoides fluvialis* sp.n. (1 ♀).

A small dark brown species, with the wings adorned much as in *C. pulchripennis* Macfie, but with two spermathecae, and differing also as indicated below.

♀. Length of wing about 0.8 mm., greatest breadth 0.36 mm.

*Head* very dark brown. Eyes bare. Palpi darkish brown, short, third segment with shallow pit in apical half; lengths of last three segments about 10, 5 and 7 units respectively. Antennae with torus very dark brown, and flagellum segments rather a light brown, with a decided change of shape between segments 10 and 11; segments 4—10 sub-equal, about 8—9 by 5—6 units, the distal ones slightly longer and narrower than others; 11—14 more elongate, sub-equal, about 12—13 by 4 units; 15 about 21 by 4 units, without stylet. The combined lengths of segments 3—10, 4—10 and 11—15 about 59, 50 and 74 units respectively. *Thorax* very dark brown above, with adornment consisting of patches, not small spots. Scutellum in middle as dark as scutum, paler at sides. *Wings* with adornment as shown in diagram (Fig. 1), resembling rather closely that in *C. pulchripennis*. Macrotrichia scanty, distribution as shown in figure. Venation as shown in figure. Halteres with white knobs. *Legs* rather dark brown. All knees dark, with a narrow paler, yellowish band both above and below. Tibiae of hind legs with in addition a yellowish band at apex.

T.R. about 2. Tarsi with terminal segments yellowish; fourth very short but not cordiform or bilobed. *Abdomen* very dark brown, with cerci paler. Spermathecae 2, moderately chitinated, oval, sub-equal, about  $38\mu$  by  $28\mu$ , the duct narrow and chitinated for only a short distance, about  $4\mu$ . The usual rudimentary third spermatheca and chitinous ring also present.

***Culicoides hylas* sp.n. (2 ♀ ♀).**

A very dark brown or blackish species resembling *C. austeni* C.I. & M., but differing as indicated below.

♀. Length of wing about 1.2 mm., greatest breadth nearly 0.5 mm.

*Head* blackish. Eyes bare, contiguous above. Palpi blackish, third segment only slightly inflated, with shallow, sub-divided pit; lengths of last three segments in one specimen about 25, 13 and 9 units, but in the other about 30, 12 and 11 units respectively. Antennae with torus blackish, and flagellum segments darkish brown but paler, yellowish, at bases; segments 4—10 oval to vasiform, ranging from about 14 by 7 to 13 by 5 (maximum) units; 11—14 more elongate, sub-cylindrical, successively longer, from about 17 to 21 by 5 units; 15 about 31 by 5 units, without stylet. The combined lengths of segments 3—10, 4—10 and 11—15 about 108, 93 and 105 units respectively. *Thorax* very dark brown or blackish; adornment consisting of large patches, not small spots. Scutellum blackish, bearing the usual 3—4 bristles and a few small hairs. *Wings* rather dark, adornment as shown in diagram (Fig. 2). The adornment very similar

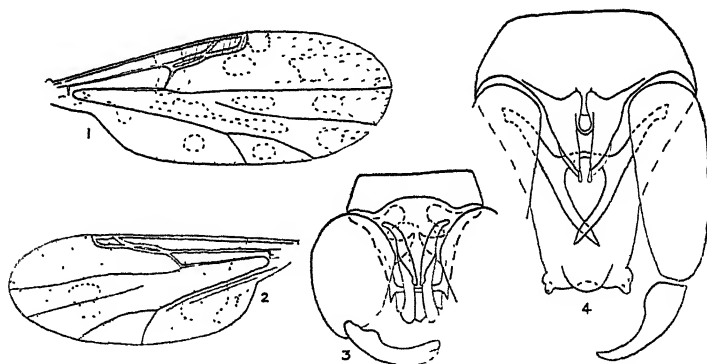


FIG. 1.—*Culicoides fluvialis* sp.n., female: diagram to show adornment of wing.

FIG. 2.—*Culicoides hylas* sp.n., female: diagram to show adornment of wing.

FIG. 3.—*Acanthohelea guianae* sp.n., hypopygium of male, ventral view.

FIG. 4.—*Monohalea hieroglyphica* Kieffer, hypopygium of male, ventral view.

to that in the African species *C. austeni*, but dark area separating two pale spots in cell  $R_5$  wider, more as in *C. milnei*, and small pale areas present at ends of veins  $M_1$ ,  $M_2$ ,  $Cu_1$  and  $Cu_2$ . Other slight differences there are, but they may come within the range of normal variation. Macrotrichia rather scanty, confined to the parts of wing distal to level of end of costa. Venation as in *C. austeni*. Halteres with whitish knobs. *Legs* very dark brown, with actual knees dark, but with a narrow zone on each side on four anterior legs paler, yellowish, and tibiae of hind legs with in addition a narrow yellowish band at

both base and apex. Fourth tarsal segments cylindrical, nearly as long as fifth. T.R. about 2. Claws, form of segments, and armature of bristles and hairs normal. Abdomen blackish; cerci paler. Spermathecae 2, highly chitinated, sub-spherical, unequal, diameters in the specimens examined about  $35\mu$  and  $45-50\mu$  respectively; the duct narrow, and chitinated for only a very short distance, about  $3\mu$ . Rudiments of third spermatheca and small chitinous ring of common duct also present.

*Culicoides debilipalpis* Lutz var. **glabrior** n.var. (1 ♀).

This insect has the wings adorned as in *C. debilipalpis* Lutz, but with fewer macrotrichia, that is, with very few or none proximal to the level of the end of the costa. The eyes are apparently bare. The palpi, antennae and spermathecae are as in *C. debilipalpis*. There is, as usual, a rudimentary third spermatheca and a chitinous ring. It is probably the same as the specimen from Nova Teutonia to which I have referred elsewhere (1939).

*Culicoides germanus* sp.n. (1 ♀).

This insect resembles closely the preceding one, *C. debilipalpis* var. *glabrior*, but is smaller and paler in colour. The distribution of the macrotrichia on the wings is similar and so are the segments of the antennae. It differs, however, in the following characters. The eyes are hairy in part at least. The pit in the third palpal segment is not so deep. The pale spot about the middle of cell  $R_5$  is more rounded, and the spermathecae have a rather longer part (about  $14\mu$ ) of the duct chitinated. It differs from *C. dasyophrus* sp.n., the species described below (which has similar wings), in the form of the antennal segments, and in having two spermathecae.

*Culicoides dasyophrus* sp.n. (2 ♂♂, 11 ♀♀).

A small dark brown species, closely resembling *C. debilipalpis* Lutz, but with fewer macrotrichia on the wings, shorter antennae, hairy eyes, and only one spermatheca.

♂, ♀. Length of wing 0.8—0.9 mm., greatest breadth 0.3—0.4 mm.

Head very dark brown. Eyes hairy, in female narrowly separated above. Palpi darkish brown, third segment inflated, with shallow sub-apical pit; lengths of last three segments in male about 7, 4 and 6 units, and in one female 9, 4 and 6 units respectively. Antennae with segments not sculptured. In male torus very dark brown, but flagellum segments and plume pale brown; segments 4—11 sub-equal in length but successively narrower, ranging from about 9 by 7 to 8 by 5 units; 12 similar to 11 and about same length, 8 by 5 units; 13—15 elongate, sub-cylindrical, sub-equal, about 21 by 5 units, the last without stylet. In female darkish brown, with a decided change of shape between segments 10 and 11; segments 4—10 shorter than in *C. debilipalpis*, sub-equal, ranging from about 7 by 6 to 7 by 5 units; 11—14 more elongate, from about 12 to 15 by 5 (maximum) units; 15 about 24 by 5 units, without stylet. The combined

lengths of segments 3—10, 4—10 and 11—15 in one specimen about 61, 50 and 78 units respectively. *Thorax* very dark brown above, the adornment consisting of large patches, not small spots. Humeral pits present. Scutellum in middle about same colour as scutum, sides a little paler; bearing four bristles and in female (but not in male) two small hairs. *Wings* in male paler than in female, and with pale spots less clearly marked. Adornment in both sexes as in *C. germanus* sp.n. Microtrichia normal. Macrotrichia in female less abundant than in *C. debilipalpis*, that is none proximal to level of end of costa; in male almost no macrotrichia, only a single line of them at tip on extreme periphery, and a few at or near end of  $M_1$ . Venation much as in *C. debilipalpis*. Costa extending about two-thirds length of wing. Both radial cells open, but, as is often the case in *Culicoides*, distal part of  $R_1$  feebly developed so that in some specimens second radial cell appears as if not formed. *M* with long petiole. Halteres with whitish knobs. *Legs* not very dark brown. All knees dark. Four anterior legs with a paler zone on each side of knees, and tibiae of hind legs with a paler zone at both base and apex. T.R. in both sexes about 2. Tarsi with fourth segment sub-cylindrical, shorter than fifth. Form of segments normal. Claws all normal, small and equal. *Abdomen* paler brown than thorax. Spermatheca single, sub-spherical, in one specimen about  $43\mu$  by  $35\mu$ ; with duct narrow and chitinised for a considerable distance, about  $18\mu$ . Hypopygium dark brown excepting harpes and ends of claspers, which are yellowish; resembling that of *C. furens*, indeed differing only in detail if at all.

This insect resembles the preceding species, *C. germanus* sp.n., closely, but has only one spermatheca instead of two, and the basal segments of the antennae of the female are shorter, the 10th only a little more than half the length of the 11th, instead of about equal in length to it.

*Culicoides* spp. (6 ♂♂, 42 ♀♀).

These specimens, many of which are damaged, are probably all *C. debilipalpis* var. *glabrior*, *C. germanus* sp.n., or *C. dasyophrus* sp.n. I have been unable to discover any means of separating these species easily without first mounting and clearing the specimens, but, to judge from a random sampling of the series, most of these insects, and perhaps all of them, are *C. dasyophrus*.

*Acanthohelea guianae* sp.n. (14 ♂♂, 6 ♀♀).

A brown species with the basal segments of the abdomen paler, yellowish, and the wings adorned with two rather indistinct dark spots, the one covering the cross-vein, and the other at the end of the costa.

♂, ♀. Length of wing about 1 mm., greatest breadth 0.3 mm.

*Head* very dark brown. Eyes bare, in both sexes rather widely separated above. Palpi brown, short, third segment sub-cylindrical, with small, shallow, sub-apical pit; lengths of last three segments in both sexes about 9, 6, and 7—9 units respectively. Antennae darkish brown. In male basal segments and plume pale yellowish-brown; segments 4—11 ranging in one specimen from about 9 by 6—7 to 10 by 4 units; 12 rather more drawn out distally, about 15 by 4 units; 13—15 elongate, in this specimen about 22, 27, and 34 by 5 units, the

last without stylet. In female segments 4—10 ranging in one specimen from about 7 by 4—5 to 11 by 4 units; 11—14 more elongate, sub-equal, about 16 by 5 units; 15 about 22 by 4—5 units, without stylet. The combined lengths of segments 3—10, 4—10, and 11—15 about 70, 57, and 86 units respectively. *Thorax* yellowish-brown with adornment of dark brown patches. No anterior tubercle. Humeral pits present and conspicuous. Bristles scanty and rather long. Scutellum dark brown in middle, paler at sides; bearing in both sexes four bristles, but no small hairs. *Wings* pale, with two rather indistinct brown areas, the one covering the cross-vein, and the other enveloping the junction of  $R_{4+5}$  with the costa. There are also indications of other markings, namely, a very faint cloud in the middle of cell  $R_5$ , and slight infuscation along distal parts of  $M_1$ ,  $M_2$ ,  $Cu_1$ , and the whole of  $Cu_2$ . Microtrichia dense, normal. Macrotrichia very scanty; in male none, in female only a very few at tip along extreme periphery. Costal bristles rather scanty; fringe normal, composed of alternating long and short hairs. Veins pale;  $M_2$  feebly developed, indeed in part hardly visible. Venation much as in *Stilobezzia*, but petiole of  $M$  quite short, only about half length of cross-vein. Costa extending about three-quarters length of wing. Cross-vein and distal portion of  $R_1$  almost in line. First radial cell diamond-shaped; second long and moderately broad, about three times as long as first. Fork of  $Cu$  at about same level as cross-vein. Halteres with whitish knobs. *Legs* rather pale brown, adorned. Femora of all legs with basal halves darkish brown and apical halves yellowish. Knees of fore and hind legs dark, those of middle legs not so dark. Tibiae of four anterior legs with basal third yellowish, and rest darkish brown; those of hind legs with broad yellowish zones at both base and apex. Femora of hind legs slightly thicker than others. All femora armed with spines, not short, stout, practically black spines such as are commonly found in *Palpomyia*, but longer, brown ones more like stout bristles. In female such spines found only at apices of femora; in male they are distributed along whole lengths of both femora and tibiae, but those on tibiae longer than those on femora, really just bristles. T.R. rather variable, 2 to nearly 3. First tarsal segments without basal spine, but with double longitudinal row of short spines. Fourth tarsal segments cordiform; fifth longer than third, in female armed at base with a pair of pointed spines. Claws on all legs alike: in female single, long, with large basal barb; in male 2, small, equal, with bifid ends. *Abdomen* yellowish, with very sparse hairs: in female with a dark brown zone near tip covering parts of segments 8—9; in male with hypopygium very dark brown. No gland rods. Spermathecae 2, not very highly chitinised, sparsely pitted, pyriform or almost sacular but narrowed at base, with practically no part of duct chitinised, sub-equal; total length about  $70\mu$  and greatest breadth  $40\mu$ . A rudimentary third spermatheca is also present. Hypopygium very broad, appearing at a low magnification like a black knob at end of body. Appearance in ventral view as shown in figure (Fig. 3). Ninth sternite without bristles, only slightly excavated in middle line posteriorly, the membrane joining it to aedeagus spiculate. Side-pieces very broad, with sparse bristles, and bearing at base two processes, the one tooth-like, the other blunt. Claspers with yellowish ends. Harpes rather broad rods which in lateral views are seen to be curved ventrally over aedeagus. Chitinised parts of aedeagus appearing in ventral view as two converging blackish rods.

The chief characters of the genus *Acanthohelea* are that the vein  $M$  of the wing is shortly petiolate, and that all the femora and tibiae are spiny. Kieffer erected the genus in 1917 from an Austra-



lian species of which only the male was known (*A. pruinosa*), and did not subsequently refer any other species to it. He included it, however, in his final key (1926) to the genera of Ceratopogonidae. So far as I am aware, no other species has hitherto been referred to the genus. While, therefore, the status of the genus must be considered somewhat doubtful, I suggest that the species described above may be referred to it. It differs from *A. pruinosa* in many small characters, e.g. the first radial cell in it is diamond-shaped, not linear, and the legs are adorned as described above, not dark brown.

*Monohlea hieroglyphica* K. (1 ♂).

This specimen is much damaged, lacking antennae, and having only one wing left, and that a crumpled one. It is therefore unsuitable for description. The wing is without macrotrichia. The hypopygium is well preserved and in ventral view appears as shown in the figure (Fig. 4), which was drawn from the specimen when not quite truly orientated, so as to show more clearly the aedeagus and harpes. The ends of the harpes are actually bent dorsally. The membrane joining the aedeagus to the ninth sternite is spiculate.

*Bezzia* (? *Parrotia*) *amnicola* sp.n. (1 ♀).

A very dark brown species of moderate size with the legs adorned as described below, the fourth tarsal segments sub-cylindrical, and all the femora and tibiae unarmed, but the fifth tarsal segments armed.

♀. Length of wing about 2.4 mm., greatest breadth 0.68 mm.

*Head* very dark brown. Eyes bare. Clypeus darkish brown, rather hairy. Palpi blackish, short, the segments sub-cylindrical, and third without pit; lengths of last three segments about 20, 15, and 15 units respectively. Antennae with torus darkish brown. Segments 3–6 dark brown at apex, almost colourless at base: segment 4 oval, about 16 by 7 (maximum) units. Rest of antennae missing. *Thorax* blackish, sparsely clothed with short, dark hairs, and bearing also a few short, stout, spine-like bristles. No scutal tubercle. Scutellum blackish, bearing a few (? 4) short, stout bristles. *Wings* pale, the veins pale brown, unadorned. No macrotrichia, and no bristles excepting those along costa. Microtrichia dense, not exceptionally minute. Costa extending about seven-eighths length of wing; only one radial cell. Tip not pointed. Anal lobe not large, angle very obtuse. Fringe normal, hairs short and extending practically to base. M sessile; distance separating bases of  $M_1$  and  $M_2$  about same as length of cross-vein. Fork of Cu slightly proximal to level of base of  $M_2$ . Halteres with dark brown knobs. *Legs* with basal segments dark or darkish brown. All knees and a zone on each side of them dark. All femora dark brown at base, but middle legs with a narrow and hind legs with a broader yellowish band just before apex. All tibiae with basal half dark brown, but apical half either paler brown or yellowish. All tarsal segments pale excepting last, which is dark brown. Form of segments

normal, none exceptionally swollen. All femora unarmed. All tibiae unarmed, and without especially long or strong bristles. T.R. about 3. Apical spine on hind tibiae unusually large, hairy as usual. Tarsi with fourth segments short but sub-cylindrical, about half length of fifth; fifth (but missing on middle legs) armed with about a dozen stout spines. First tarsal segments all without basal spines. Claws (but missing on middle legs) long, equal, each with a large barb. *Abdomen* with tergites rather dark brown, but not as dark as thorax; and venter pale, with tuft of long curved bristles on each side of vulva. No gland rods. Spermathecae 2, highly chitinated, obovate, unequal, total length and greatest breadth in the specimen examined about  $71\mu$  by  $57\mu$ , and  $93\mu$  by  $71\mu$ .

This insect does not fit well into any of the genera (or subgenera) erected for species of the *Bezzia* group in which the fourth tarsal segments are sub-cylindrical. A reclassification of the group will probably be necessary as soon as a sufficiently large number of species is known to enable it to be done satisfactorily.

***Bezzia* (*Homobezzia*) *concoloripes* sp.n. (1 ♀).**

A rather small and dark brown species with the legs almost uniformly dark brown, the fourth tarsal segments sub-cylindrical, only the fore femora armed, and all the fifth tarsal segments unarmed.

♀. Length of wing about 1.5 mm., greatest breadth 0.5 mm.

*Head* very dark brown. Eyes bare. Palpi dark brown, quite short, third segment sub-cylindrical, without pit; lengths of last three segments about 9, 7, and 7 units respectively. Antennae with torus dark brown, and flagellum segments rather paler, 3—10 pale brown at base; segments 4—10 oval but somewhat narrowed anteriorly, sub-equal, about 10—11 by 5 units; 11—14 more elongate, sub-equal, about 17—19 by 5 units; 15 about 19 by 5 units, without stylet. The combined lengths of segments 3—10, 4—10, and 11—15 about 92, 75, and 93 units respectively. *Thorax* very dark brown above, sparsely clothed with short dark hairs, and bearing also a few stout bristles. No anterior tubercle. Scutellum dark brown. *Wings* pale, the veins pale brown or almost colourless; unadorned. No macrotrichia, and no bristles excepting those on costa. Microtrichia normal. Costa extending nearly seven-eighths length of wing, ending at a level proximal to that of end of  $M_2$ ; only one radial cell, which is not very narrow. Tip rounded. Anal lobe not large, the angle very obtuse. Fringe normal.  $M$  sessile, distance separating bases of  $M_1$  and  $M_2$  about same as length of cross-vein. Fork of  $Cu$  at about same level as cross-vein. Halteres with dark brown knobs. *Legs* (including basal segments) almost uniformly dark brown, but bases of tibiae and first 3—4 segments of tarsi a little paler than rest. Femora of fore legs armed with eight stout, blackish spines; others unarmed. Tibiae without especially long or strong bristles, but those of middle legs (but not others) armed just before apex with a single stout spine; tibiae of hind legs with apical spine hairy, as usual in these genera. T.R. about 1.5. Tarsi of all legs with first segment devoid of basal spine, fourth sub-cylindrical, not cordiform, fifth unarmed. Claws on all legs small, half length of last segment, equal, with a very small barb which might easily be overlooked. *Abdomen* dark brown, but not as dark as thorax. Gland rods present on tergites 4—7, very long, extending to base of abdomen. Vulva with-

out any especial armature. Spermathecae 2, highly chitinated, oval but rather unequal, partly collapsed in the unique specimen, but apparently measuring about  $43\mu$  by  $34\mu$  and  $32\mu$  by  $30\mu$  respectively; the duct narrow and chitinated for some distance, about  $8-11\mu$ .

This insect resembles in some respects *Homobezzia nyasae* Macfie, in which species, however, the thorax bears an anterior tubercle, and the legs are adorned.

38 Gordon Mansions,

London, W.C.1.

September 20th, 1939.

*Aleuonota gracilentia* Er. (Col., Staphylinidae): a new locality and an unusual habitat.—On July 27th, 1939, I found a single example of this rare species (*Homalota splendens* Fowler) in a nest of the ant *Lasius brunneus* Latr. in the decayed interior of the trunk of an elm tree in Windsor Forest. Its presence among the ants was doubtless accidental, for not only has Mr. H. Donisthorpe never met with it here in any of the numerous nests of the above ant which he has worked, but as far as I know it has never before been recorded with ants; it appears chiefly to have been taken at roots of grass, etc., in sand and chalk pits or by sweeping on downs, situations far removed from that of the present capture. I believe also that this constitutes a new record for Berkshire.

The species of this genus (which I prefer to regard as a subgenus of *Atheta*) are so scarce that it may be worth mentioning here my experience of two of the others, as follows:—

*A. atricapilla* Rey (= *elegantula* Fwl.): one by evening sweeping on a grassy bank near the mouth of the Thames, Isle of Grain, 21.v.36.

*A. aurantiaca* Fauv. (= *rufotestacea* Fwl.): two under a stone on Box Hill, Surrey, 16.iv.37. (The first British specimen was taken in the same locality, and the only other that I know of at Guildford, also on the North Downs, both by the late Mr. G. C. Champion).—A. A. ALLEN, 63 Blackheath Park, London, S.E.3: December 17th, 1939.

*A note on the habitat of Henoticus serratus* Gyll. (Col., Cryptophagidae).—The appearance in some numbers of this local beetle may possibly throw some light on where it is to be found. A specimen was taken in 1934 near Hay-on-Wye, inside an oak stump. The tree had been felled for two years, before which it had been attacked by a fungus, possibly one of the Polypori, which had converted the interior of the stump into an extremely tough white substance, in texture rather resembling a fungus. After some difficulty, a piece of this was detached and beaten over a sheet, when one specimen of the *Henoticus* was obtained.

In July, 1939, the stump of a recently felled tree attacked by the same fungus was found in Great Witley Park, Worcestershire, and the *Henoticus* was discovered under pieces of the white substance with which the stump was filled. It was almost impossible to cut this, so only detached fragments were examined, but fifteen specimens of the beetle were obtained. An attempt to get a piece of the external fructification of the fungus for identification was unsuccessful, as it was too hard and firmly fixed to the tree, so this imperfect observation is put on record in the hope that some other collector may be able to follow it up.—G. H. ASHE, M.A., Gribblemead, Colyton, Devon: January 6th, 1940.

A FURTHER CONTRIBUTION TO OUR KNOWLEDGE OF THE  
GALL-MAKING HYMENOPTERA OF THE WESTERN ISLANDS  
OF SCOTLAND.

BY PROF. J. W. HESLOP HARRISON, D.SC., F.R.S.

During the past season the work of assembling material for our Flora of the Inner and Outer Hebrides has been prosecuted with greater vigour than ever. Many more islands, both in the Inner and Outer groups, have been explored, whilst others have been revisited to complete the investigations commenced in previous years. As a result, not only have our floristic and allied studies been advanced significantly, but, in addition, we have added substantially to our knowledge of the distribution of various insect groups. In connection with the latter, it will be remembered that a short paper dealing with the Hebridean gall-making Hymenoptera appeared in 1939, *Ent. Mon. Mag.*, 75: 60-3, and the present contribution is designed to supplement that publication by setting out our recent observations in the group.

Before doing so, however, in order to avoid confusion, it seems well to emphasise certain geographical facts. Firstly, we have visited two Bernerays and two Berneras. The first Berneray lies in the Sound of Harris, the second to the extreme south of the Outer Islands in the Barra Group, and the two Berneras off the west coast of Lewis; the two Bernerays are herein designated Berneray (H) and Berneray (B) respectively. Similarly, we have explored three Pabbays; one Pabbay (H) may be found on the map in the Sound of Harris, the second Pabbay (B) in the Barra Group, and the third Pabbay (S) off Broadford, Skye. The other islands investigated call for no comment except that it should be noted that the Isle of Gunna lies between Coll and Tiree.

CYNIPIDAE.

*Rhodites eglanteriae* Htg.—Although the extensive new areas explored in the Outer Hebrides have revealed a rose flora very much richer than anyone had anticipated, this is the only rose Cynipid those islands have produced. It turned up on *Rosa Sherardi* forms in the south of Barra in gorges on, and near, Ben Tangaval, and on *Rosa glaucophylla* in the Allt Volagir gorge on South Uist.

*R. spinosissima* Gir.—On *Rosa spinosissima* in a tiny ravine just east of Balephetrish Hill, Isle of Tiree, and near Loch Cliad, Coll.

*Xestophanes brevitarsis* Thoms.—Rare on Tormentil on the central moorlands of Coll.

*Andricus pilosus* Adl. (sex. g.), *A. fecundatrix* Htg. (ag. g.).—In my previous paper, I directed attention to the fact that the islands were not so bereft of oaks as was generally supposed. Nevertheless, I did not imagine that this observation applied to the Isle of Coll, since that island, with its neighbour Tiree, is almost always referred to as treeless. Hence we were very pleased indeed to find not only oak, but also birches, aspens and blackthorns, growing quite naturally on Coll. Moreover, the oaks carried a far from negligible Cynipid fauna. The present species, in its agamous generation, found on oak scrub just east of Arinagour, formed an interesting member of this group.

*Andricus curvator* Htg. (sex. g.), *A. collaris* Htg. (ag. g.).—Here the sexual generation was found on oaks flourishing amongst rocks near Loch Airidh Meall Bhreide, Coll.

*Andricus quercus-radici* Fab. (sex. g.), *A. trilineatus* Htg. (ag. g.).—This species is new to my Hebridean lists, and it occurred in abundance in the latter generation on a single oak bush observed near Loch Eatharna, Coll.

*Neuroterus quercus-baccarum* L. (sex. g.), *N. lenticularis* Oliv. (ag. g.).—Sparingly on the same group of shrubs as supported *Andricus curvator*.

#### CHALCIDIDAE.

*Isosoma graminicola* Gir.—Very rare on *Agropyron* on Vatersay.

#### TENTHREDINIDAE.

*Pontania pedunculi* Htg.—To the islands known previously to produce this species may be added Coll, Tiree, Gunna, Mingulay, Pabbay (B), Sandray, Vatersay, Muldoanich, Barra, Berneray (H), Pabbay (H.), Lewis, Harris, Great and Little Bernera, Skye, and Pabbay (S); it galls *Salix aurita*.

*P. collactanea* Forst.—On the same islands as noted for the preceding species, with the addition of Berneray (B), Fuday and Flodday near Vatersay; this species attacks *Salix repens*.

*P. puella* L.—Common on leaves of *Salix aurita* on all the isles listed for *Pontania pedunculi*, both in the present and in the preceding paper.

*P. leucosticta* Htg.—Collected as larvae on *Salix aurita* leaves on Loch Scresort Rhum, and at many points on the Isles of South Uist and Barra.

King's College (University of Durham),  
Newcastle-upon-Tyne, 2.  
October 30th, 1939.

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ON THE BIOLOGY OF THE SAWFLY *XYELA JULII* BRÉBISSEON  
(HYM., SYMPHYTA).

BY ROBERT B. BENSON, M.A., F.L.S., F.R.E.S.

Since finding *Xyela julii* Brébisson on Chipperfield Common, Herts, and Ivinghoe Common, Bucks, in May, 1935, I have repeatedly sought in vain for its larva. The fact that in both localities I found the adults flying around birch catkins only when the catkins were shedding pollen and when pine trees were near at hand, and that the species could never be found far away from pine, made me suspect pine as the host-plant. On May 21st, 1939, I was searching cones of *Pinus sylvestris* L. on Ivinghoe Common for signs of the larvae, when I discovered a dead female *Xyela julii* with her ovipositor inserted into a male cone.

I collected this cone and any others nearby that appeared unhealthy. The next day a small whitish larva had emerged from one of the cones, but none of the peduncles showed any signs of boring, so that I presume the larva had been feeding among the stamens. The larva agreed exactly with the description given by Yuasa (1922, A classification of the larvae of the Tenthredinoidea, *Illinois biol. Monogr.*, 7 (4): 39-42) for the larva of the North American *X. minor* Dyar. As it was only 3.5 mm. long, I decided to preserve the specimen for the British Museum collection instead of trying to breed it, in which attempt I might have failed and lost the larval specimen as well. The whole larva is creamy white with a yellowish head; the thoracic legs are present, but rudimentary, and each segment of the abdomen, including the first as well as the ninth, has a pair of slight ventral swellings to represent rudimentary abdominal legs.

If the detailed habits agree with those of *X. minor*, as seems likely, they are as follows: the larvae feed on the staminate cones of pine; they leave the cones before these blossom and drop to the ground, where they form subterranean cells (Dyar, 1898, *Can. ent.*, 30: 176).

In 1936, Dr. K. G. Blair actually bred a female *X. julii* from an old Psychid case, but it was not recorded at the time, as the circumstances were exceptional. On May 2nd, 1936, he collected a number of cases of *Solenobia inconspicuellae* Stainton off the bark of birch and chestnut trees, close to some tall pines, at Oxshott, Surrey. On July 19th a dead female *X. julii* was found in the box. The specimen had probably emerged soon after the cases were collected, as the species is single-brooded, appearing usually at the beginning of May in the south of England. Splinters of bark with the Psychid

cases were then examined for a cocoon without result, but in an old weather-worn case was found a cocoon of rather coarse brown silk with some shrivelled remains at one end. This case was submitted to me at the time for examination.

Dr. Blair's discovery shows that *X. julii* Brébisson does not necessarily go underground to form its cocoon, and suggests that the fully-fed larva may make use of any suitable cranny to pass its resting stage through the summer and winter.

Department of Entomology,  
British Museum (Natural History),  
London, S.W.7.  
December 20th, 1939.

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#### SAWFLIES (HYM., SYMPHYTA) IN TEESDALE: JUNE, 1939.

BY ROBERT B. BENSON, M.A., F.L.S., F.R.E.S.

My wife and I spent the first week of June, 1939, collecting Hymenoptera near Middleton in Upper Teesdale. The weather during this week was exceptionally hot and sunny with scarcely a cloud in the sky the whole time. Sawflies were difficult to find during the mid-day hours, but were abundant for about three hours in the early morning (6.30 to 9.30 a.m.) and again for the last three hours before sunset (6 to 9 p.m.). Most of the collecting was concentrated on the willows on the banks of the Tees and Langdon Beck at an altitude of about 1,000 to 1,300 feet. As the Tees separates Durham (DM) from Yorkshire (NY) at this point, the specimens collected are records for either or both of these counties, as indicated below. One trip was made to Allenhead, Northumberland (SN) in the Tyne drainage system. Although collecting almost entirely in a single type of habitat, over fifty-five species of sawflies were met with, quite apart from large numbers of Ichneumonidae and other Hymenoptera. Good series of the local sawflies *Pontania femoralis* Cameron, *P. phyllicifoliae* Forsius and *P. pusillator* Forsius were obtained, and in addition representatives of a few other species of special value for study because of their rarity. All the specimens collected were placed in the British Museum.

*Loderus pratorum* var. *gilvipes* Klug (NY).—One ♀ collected from *Equisetum*. Previously this was only known as a British species on the basis of a few typical (red-banded) specimens taken by Mr. Edward Saunders at Chobham, Surrey, first about 1883, and at Woking in the same district by the Rev. F. D. Morice in May, 1897. On May 20th, 1919, Dr. W. J. Fordham found one specimen of the form with a black abdomen, unbanded with red

(var. *gilvipes* Klug) on the banks of the River Brock (Lancashire) near Garstang (Moriçe, 1920, *Ent. mon. Mag.*, 55: 58-60).

*Dolerus saxatilis scoticus* Cameron (DM). Several specimens. A typically Scotch species, previously not recorded from England, although there are in the Hope Department, Oxford, some males from Gatley, Cheshire, taken by Mr. T. R. Hardy.

*D. gessneri* Ed. André (SN).—Several specimens at Allenhead, Northumberland. Previously recorded only from Scotland and Ireland, but my colleague Mr. J. F. Perkins found it in the Forest of Dean, Gloucestershire, in June, 1936.

*Amauronematus sagmarius* Konow (NY and DM).—Several specimens of a form of this species were captured on both sides of the Tees. Previously in Britain it has been known only from Dartmoor (R. C. L. Perkins) and Co. Wicklow, Ireland (A. W. Stelfox).

*Pteronidea jugicola* C. G. Thomson (NY).—One ♀. Previously in Britain only known from two specimens, one from the Culbin sands, Moray (J. J. F. X. King) and the other from the east end of Loch Morlich, Inverness (Benson, 1935, *Ent. mon. Mag.*, 71: 243).

*Pristiphora asperlatus* Benson (NY and DM).—Several specimens, some of which laid eggs in leaves of *Salix phylicifolia* L. and produced larvae. Previously in Britain recorded only from the summits of the highest mountains in the Scottish highlands (Benson, 1935, *Trans. ent. Soc. Lond.*, 83: 36-37) and abroad only in arctic Europe and Asia. In Ireland, however, Mr. A. W. Stelfox found two males close to the sea at Annagh, The Mullet, Co. W. Mayo, on June 20th, 1936.

Department of Entomology,  
British Museum (Natural History),  
London, S.W.7.  
December 20th, 1939.

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A Tachinid (Dipt.) Shelter.—The spaces between the imbricated scales of fir cones are known as popular refuges of insects. An example, perhaps worth noting, was picked up here by Lt.-Col. F. C. Fraser on August 6th last, and given to me. Some twelve specimens of the common Tachinid, *Paraphorocera senilis* Mg., were housed between the scales of a cone of *Pinus sylvestris* L., looking like bees in a comb. The day was warm (a shade temperature of 72°F.), after a night when the temperature fell to 41°F.—F. H. HAINES, Apple-slade, Linwood, Ringwood, Hants.: January 11th, 1940.

*Eumicromus angulatus* (Steph.) (Neuropt., Hemerobiidae) in Hertfordshire.—On October 21st, 1939, at Haileybury College, near Hertford, a single female specimen of this rare Neuropteran was taken by sweeping in rough grass and other vegetation, on an ancient unused track known as the 'Roman Road.'—E. S. BROWN, Hailey Lodge, Hertford Heath, Hertford: January 6th, 1940.

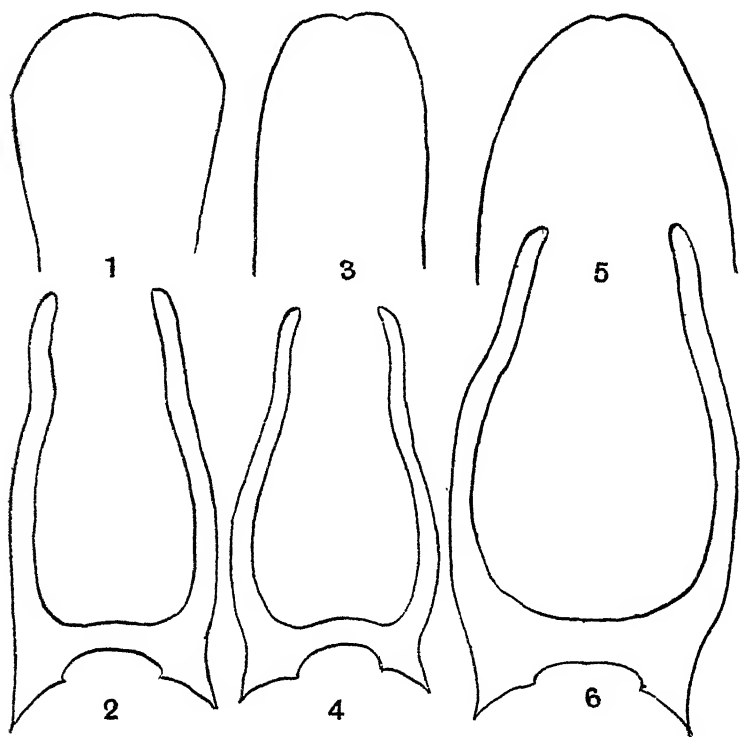


*BLEDIUS SPECTABILIS* KRAATZ AND *B. LIMICOLA* N.SP.  
(COL., STAPHYLINIDAE).

BY THE REV. C. E. TOTTENHAM, M.A., F.R.E.S.

There appear to be two distinct species in British collections confused under the name *Bledius spectabilis* Kraatz (1857, *Naturg. Ins. Deutsch.*, 2: 851, note). Since it is impossible under present circumstances to see Kraatz's type, the true *spectabilis* is a matter of conjecture. There are, however, specimens from Kraatz himself in the British Museum (Nat. Hist.), so I am assuming that these are examples of *spectabilis*, and I am regarding the British species which agrees with these examples as being that species. The second of the British species I call *limicola* sp.n.

*Bledius limicola* sp.n. is closely allied to *B. spectabilis* Kraatz, and may be distinguished by the following characters:—



Figs. 1-6.—Apex of median lobe and paramere of *Bledius* spp.  
1, 2, *B. tricornis* Herbst. ; 3, 4, *B. limicola* sp.n. ; 5, 6, *B. spectabilis* Kraatz.

The build of the insect is distinctly more slender. The coloration of the elytra is a little different, the dark scutellary patch being more extensive, extending basally to the shoulders, and being prolonged to a point almost to the apex of the suture, whereas in *spectabilis* this dark patch is but indistinctly extended along the base, and is not prolonged along the suture to anything like the same extent. The second segment of the antennae is always distinctly darkened, at least in the middle, whereas in *spectabilis* this darkening is not apparent. The puncturation of the thorax is more regular and definite in *limicola*, and that of the elytra is more marked and closer. The thorax differs in shape in the two species. In the male, the anterior margin slopes obliquely backward from the horn in *limicola* but is more nearly at right angles to the horn in *spectabilis*; the anterior angles are rounded in the former species, but marked in the latter; the sides in *limicola* are straight and parallel in front in *limicola*, then angularly constricted in a straight line to the base, whereas in *spectabilis* the constriction is not marked by so distinct an angle, and the sides are feebly curved. In the female, the thorax of *limicola* is distinctly more transverse. The thoracic horn is very variable in length in both species, but if long series be examined it will be found to be longer on the average in *limicola*.

The two species differ in the form of the aedeagus, this organ being much broader in *spectabilis*, and with the median lobe more narrowed apically. In both species the parameres are more curved basally than in *Bledius tricornis* Herbst. The two prongs of the paramere, which is attached basally to the dorsal surface of the median lobe, are bent slightly downwards so as to embrace the lobe, and towards their apices they are situated ventrally to this portion of the aedeagus.

The only examples of *spectabilis* which I possess are a single female from Clacton-on-Sea (NE) and a long series from Chesil Beach (DT). *B. limicola*, on the other hand, I have taken at Deal (EK) and Wakering (SE) and plentifully at Highcliffe (SH), where the type, now in my collection, was obtained in September, 1939. *Dyschirius politus* (Dejean) is not uncommon with this species at Highcliffe.

In the British Museum (Nat. Hist.), the Kraatz specimens of *spectabilis* are from S. France, and there is a single example from Athens. There is a series from the Sharp collection from Mesopotamia which appear to be identical with *limicola*, and I notice that on one pin of these examples Sharp has put a label, '*Bledius lancifer* D.S. proposuit,' showing that he had recognised the distinctness of the species. There is also an example from Fao in which the dark colour is more or less suffused over the elytra, which is evidently a variety of *limicola*. I have not examined the specimens in any of the British collections at the British Museum.

88 Station Avenue,  
W. Ewell, Surrey.  
October 17th, 1939.

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A NOTE ON *XYLEBORUS SAMPSONI* DONISTH. (COL., SCOLYTIDAE).

BY K. G. BLAIR, D.SC., F.R.E.S.

Mr. Donisthorpe (*antea*, p. 6), in withdrawing *Taphrorychus villifrons* Dufour from the list of British Coleoptera, erects upon the female specimen upon which the introduction of the *Taphrorychus* was based a new species of *Xyleborus*. It seems to me, however, that Coleopterists should exercise some caution in accepting such species, founded upon a single specimen admittedly very closely allied to a well-known species. Thus to my mind the individual now concerned might with at least equal reason be considered to be but a slight variant of *X. dryographus* Ratz., and was indeed so determined by me when I drew Mr. Donisthorpe's attention to the mistake and asked him if he would confirm my opinion. Mr. Donisthorpe's keen eye, more readily appreciative of small characters than my own, at once detected the small differences mentioned by him, differences the existence of which on more critical examination I had to admit in the insects we were comparing. It is on the interpretation of these differences that Mr. Donisthorpe and I fail to agree, my opinion remaining as stated.

Mr. Donisthorpe, as a competent Coleopterist, is of course fully entitled to the expression of his opinion, and which of us is the more correct must be left to the decision of others. Mr. Donisthorpe's action has at least the effect of focussing attention upon the point, which, had he merely accepted my opinion, would have remained indefinitely without further examination.

In the meanwhile collectors might with advantage follow up the hint given by Mr. Donisthorpe and carefully compare series taken from thick bark of oak and beech with similar series taken from thin bark of these trees. It is also possible that the males, if procurable, of such series may exhibit stronger differences than do the females.

British Museum (Nat. Hist.),  
London, S.W.7.

January 9th, 1940.

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*An abnormal food-plant of Polydrosus confluens* St. (Col., Curculionidae).—In May, 1939, I found this species in plenty on young oak shrubs in a small area in the woods at Burnham Beeches, Bucks, at a distance from any broom or gorse. In a more open, healthy part of the same locality, where broom flourishes, sweeping and beating this plant failed to produce the weevil, though a more prolonged attempt might have succeeded. Broom and gorse are apparently the only recognised food-plants of the species; at any rate the standard works on British beetles mention no others.—A. A. ALLEN, 63 Blackheath Park, London, S.E.3: December 17th, 1939.

HYDROPORUS CANTABRICUS SHARP (COL., DYTISCIDAE),  
AN ADDITION TO THE BRITISH LIST.

BY FRANK BALFOUR-BROWNE, M.A. (OXON. ET CANTAB.), F.R.S.E.,  
F.Z.S., F.R.E.S., F.R.M.S.

In May, 1937, on the Southhaven Peninsula, Dorset, I took some specimens of an *Hydroporus* which I entered in my journal as '*melanarius?*' and I forgot about them. Recently, Captain C. Diver sent me a collection of water-beetles he had made in the same area during 1939, and this included several examples of this same doubtful *melanarius*. After a lengthy examination I concluded that all these specimens were somehow different from *melanarius*, and a comparison with *H. cantabricus*, specimens of which I took in the Channel Islands, proved that they were identical with it. I sent a few specimens to my son at the British Museum for his opinion, and, in the meantime, a comparison of *melanarius* and *cantabricus* made me doubtful as to whether they are distinct species. Sharp (1882, Dytiscidae: 457), when he first described *cantabricus*, stated that it 'comes very close indeed to some of the more shining varieties of *Hydroporus melanarius*, but I have not been able to connect it with them at present; the elytra have the punctures more numerous, and their junction with the thorax forms a less indistinct angle, the colour (especially of the head and thorax), is paler in all the specimens.'

My son, having compared my specimens with the type series, has no doubt that they are *cantabricus*, but does not regard them as a variety of *melanarius*. He says: 'Although there is no doubt that *cantabricus* is very close indeed to *melanarius*, I think the two should be regarded as distinct. I find that in the former the pro- and meso-tarsi have the basal segment distinctly wider than the corresponding segment of *melanarius*, and further that *cantabricus* is uniformly a little more closely and strongly punctate on the ventral surface, particularly the metasternum and coxal plates. The dorsum is also, although equally strongly "alutaceous," distinctly more shining in the former species. Although less valuable, the venter of *cantabricus* is always reddish, whereas in *melanarius* it is always decidedly piceous, that is, in fully mature specimens.'

I cannot see the difference in the pro- and meso-tarsi, but the anterior tibiae of the male of *cantabricus* are slightly wider than those of *melanarius*. I mounted elytra of both sexes of both forms and photographed a small part of each by transmitted light at a magnification of 175 with a view to comparing the sculpture, which consists of a fine reticulation and what are described as punctures,

but which are really pits in each of which a puncture occurs. In *cantabricus*, these pits are rather more numerous than in *melanarius*, and in a square of 2 mm. sides the number near the base of the elytron varies from eleven to sixteen in *cantabricus*, but is only about twelve in *melanarius*. The size of the pit is rather larger in the male *cantabricus* and is perhaps very slightly larger in the female than in *melanarius*, where there is no noticeable difference in the sexes. The reticulation consists of rather larger meshes in *cantabricus*, which may account for that form being rather more shining than the average *melanarius*. I can detect no difference in the sexual armatures of the two forms.

Thus the differences between the two are in degree only, and the question as to whether or not they should be regarded as distinct species is difficult to decide. *H. palustris* and *H. incognitus* are closely related, but they are always distinguishable by the sculpture of the prosternum and also by the male secondary sexual characters. *H. erythrocephalus* and *H. rufifrons* are easily confused, but here again the male genital armature at once distinguishes them. In *cantabricus* and *melanarius* there is no single character in which the two are definitely different, and it may be that they are varieties of the same stock and that var. *cantabricus* is an habitat form. On the other hand, its discovery in Dorset admits of the possibility that it has recently arrived from France or the Channel Islands and of its successful colonisation of the Southhaven area, where it appears to be widely spread.

Hook Place,

Burgess Hill, Sussex.

January 5th, 1940.

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*Coleoptera* (chiefly *Staphylinidae*) at Oxshott in winter.—I have taken the following species, among many commoner ones, at various times in the winter months (November to February) during the past few years, at Oxshott, Surrey. With the one exception noted, they were all obtained by sifting wet moss in a small swampy area.

*Ocyusa maura* Er., very abundant; *Atheta vilis* Er. (this usually rare species is abundant here); *Oxyroda elongatula* Aub., *Calodera aethiops* Gr., *Evaesthetus ruficapillus* Lac., *Bryaxis sanguinea* Reich., rather common; *Oxyroda lentula* Er., *Atheta gyllenhali* Th., *A. terminalis* Gr., *Myllaena dubia* Gr., *M. infuscata* Kr., *Stenus pusillus* St., *S. fornicatus* St., *Actobius cinerascens* Gr., not common; *Ocalea picata* St., *Meotica exilis* Er., *Atheta nigella* Er., *Pselaphus dresdensis* Hbst., scarce; *Atheta fallax* Kr., *A. clancula* Er., *Stenus nitidiusculus* St. (the rare macropterous form), *Trogophloeus rivularis* Mots., *Quedius nemoralis* Bau., *Acidota cruentata* Mann., single specimens; the last-named was found crawling on the sand under a clump of heather at the edge of a dry ditch, on a warm sunny day in January, 1938.—A. A. ALLEN, 63 Blackheath Park, London, S.E.3 : December 17th, 1939.

*Aculeate Hymenoptera from the Highlands.*—During August, 1939, the following localities were visited:—

Fort William, Inverness, August 5th—12th. Hymenoptera were most abundant on the sheltered wooded slopes on the far side of Loch Linnhe. Generally speaking, the ground was marshy with a luxuriant growth of willow and birch. The dry earth adhering to the roots of fallen trees provided nesting sites for aculeates; this feature was noticed also in Skye. Except during one morning, the weather was unfavourable at Fort William.

Skye, August 13th—24th. Headquarters were made at Portree. Collecting was done at Sligachan, one day; Uig, one day; Dunvegan, an hour and a half; Raasay, one day; Fladday, a few hours. Returning south, one day was spent near Kirm, Argyll, and on the following afternoon (August 28th) an hour's visit was made to Corrie, Arran. Mr. G. M. Spooner kindly identified *Prionocnemis schiodtei* and *Mimesa dahlbomi*.

LIST OF SPECIES.—*Chrysis ignita* (L.), Raasay and Fladday; *Prionocnemis schiodtei* Haupt., ♀ Corrie; *Pompilus spissus* Schiodte, 2 ♀♀ Fort William; *Anoplus nigerrimus* (Scop.), 2 ♀♀ Fort William, ♀ Raasay, ♀ Portree; *Cero-pales maculata* (Fab.), 2 ♂♂ and 1 ♀ Corrie; *Ancistrocerus pictus* (Curt.), 2 ♀♀ Fladday, 2 ♀♀ Raasay, in both instances caught a few yards from the sea; *A. trimarginatus* (Zett.), ♂ Dunvegan; *A. parietinus* (L.), ♀ Fort William, nesting in soil of uprooted tree; *Vespula vulgaris* (L.), Fort William, Portree, Dunvegan, Raasay, and Kirm; *V. rufa* (L.), Fort William, Dunvegan, and Raasay; *V. austriaca* (Panz.), 6 ♀♀ Fort William, only in marshy places; *V. sylvestris* (Scop.), Portree and Dunvegan; *V. norwegica* (Fab.), Fort William and Raasay; *Mimesa dahlbomi* (Wesm.), 2 ♀♀ Fort William; *Coelocnabro leucostomoides* Richards, ♂ and ♀ Fort William; *Crossocerus tarsatus* (Shuck.), ♀ Portree; *C. varus* Lep. and Brul., 3 ♂♂ and 1 ♀ Fort William, ♀ Portree; *Blepharipus dimidiatus* (Fab.), Fort William, Portree, Dunvegan, Raasay, and Corrie; *Mellinus arvensis* (L.), ♀ Corrie; *Colletes succincta* (L.), ♂ Dunvegan, ♂♂ and ♀♀ Kirm, both sexes very common flying about the heather on the lower slopes of a mountain. Apparently this species has not been recorded before from Inverness or Argyll. *Halictus calceatus* (Scop.), a colony containing both sexes in a sandy path on Raasay; *H. albipes* (Fab.), ♀♀ Raasay, ♂♂ and ♀♀ Portree, ♂ Kirm; *H. fratellus* Perez, 3 ♂♂ Fort William, 3 ♀♀ Raasay, 2 ♀♀ Corrie; *H. leucopus* (Kirby), ♂♂ and ♀♀ Portree and Dunvegan; *Sphécodes hyalinatus* von Hag., ♂ Fort William; *S. fasciatus* von Hag., ♂ and ♀ Corrie, hovering together over a bank; *Andrena bicolor* (Fab.), Dunvegan, Portree, Uig, and Raasay; *A. fuscipes* (Kirby), ♀ Corrie; *A. coitana* (Kirby), Fort William, and common at Portree and Dunvegan; *A. tarsata* Nyl., 3 ♀♀ at Potentilla, Fort William; *A. subopaca* Nyl., 2 ♀♀ Fort William, ♀ Portree, ♀ Corrie; *Nomada obtusifrons* Nyl., common at Portree, ♀ Dunvegan, ♀ Fort William; *N. rufipes* Fab., 2 ♀♀ Corrie; *Bombus lucorum* (L.), Fort William, Portree, and Dunvegan; *B. jonellus* (Kirby), Fort William, Portree, and Fladday; *B. lapponicus* (Fab.), ♂ Ben Nevis, at 2,000 feet; *B. hortorum* (L.), Fort William and Skye; *B. rudericus* (Mull.), Uig, common, only in fields close to the sea; *B. agrorum* (Fab.), very common in Skye and Raasay, where no ♂♂ were seen, Fort William and Kirm, fresh and worn ♂♂ abundant; *B. muscorum* (L.), Uig, Sligachan, Raasay, and Fladday, but no ♂♂; *Psithyrus barbutellus* (Kirby), Portree, Sligachan, Raasay, and Fort William; *P. sylvestris* Lep., ♀ Fladday, ♀ Kirm.—K. M. GUICHARD, 10 Lyndhurst Gardens, Hampstead, N.W.3: December 12th, 1939.

*Strange behaviour of Astilbus canaliculatus* F. (Col., Staphylinidae).—I was very much interested in my friend Mr. A. H. Hamm's note (1939, *Ent. Mon. Mag.*, 75: 279) on the habits of *Astilbus canaliculatus* F., especially as these are the first records of the beetle carrying any insect other than ants, living or dead. It is of course a well established fact that *Astilbus* attacks and kills ants, and that they are its proper food. As Mr. Hamm justly remarks, why should the beetle go to the trouble and labour of carrying a fairly large fly such a long distance, if it were only intended for food. I cannot agree, however, with the suggestion that it was for storage as food for its future progeny. I have found the larvae of this beetle, as well as the perfect insect, actually in the nests of the ants, though the imago more generally away from them, but almost always in company with ants. I do not think a fly or any other insect stored by the beetle would last long where ants were about. I suggest that the fly was being carried to a convenient spot where it would attract ants, and give the beetle the opportunity to attack and kill them whilst they were occupied with the bait. This is not in any way improbable. Diptera themselves have been recorded robbing the fierce driver ants of their brood when on the march, actually settling and dragging the pupa out of the very jaws of the ants. The beetle would simply pounce on and kill a feeding ant (or one carrying the fly) and devour it. Should the beetle be attacked it would protect itself with its repugnatorial glands. I also consider that the live aphid mentioned by Mr. Hamm was intended as a lure for ants. The idea that a beetle should set a trap is not too far-fetched. Ants themselves carry the eggs of aphides into their nests for the winter, and, when hatched in the spring, take them out and place them on their proper food-plants. This shows greater foresight than the mere setting of a trap.—HORACE DONISTHORPE, British Museum (Nat. Hist.), London, S.W.7: December 17th, 1939.

*Cryptorrhynchus lapathi* L. (Col., Curculionidae) and *Ephialtes tuberculatus* Frc. (Hym., Ichneumonidae).—Willows here have been badly infested, for quite twelve years, with *Cryptorrhynchus lapathi* L., the beetles apparently enjoying complete immunity from parasitic attack. Although I have noted both *Ephialtes tuberculatus* Frc. and *E. carbonarius* Chr. in the Forest, as near as Broomy and Boldrewood, neither of these species had been, apparently, attracted by the numerous potential hosts at Appleslade. It was interesting, therefore, to see that in July and September last season *Nemesis* had ultimately appeared in the form of *E. tuberculatus*, which was flying commonly among the affected coppice.—F. H. HAINES, Appleslade, Linwood, Ringwood, Hants.: January 11th, 1940.

All four British species of *Notonecta* (Hemipt.) taken simultaneously from one pond.—*Notonecta glauca* L., *N. maculata* F., *N. viridis* Delc. and *N. obliqua* Gallen were taken at the same time from one pond, near Haileybury College, Hertford, Herts, on September 29th, 1938. The pond had only been constructed a few months, by damming a small stream, but contained a considerable growth of *Ranunculus aquatilis* L.; it has now dried up again owing to a flaw in the dam. The bottom was muddy, but *Notonecta maculata* found the necessary hard surface for oviposition in the concrete of which the dam was constructed. The whole pond was some twenty yards by ten yards, with a small island in the middle.—E. S. BROWN, Hailey Lodge, Hertford Heath, Hertford: January 8th, 1940.

*LORDOMYRMA INFUNDIBULI* (HYM., FORMICIDAE), A NEW  
SPECIES OF ANT FROM DUTCH NEW GUINEA.

BY HORACE DONISTHORPE, F.Z.S., F.R.E.S., ETC.

*Lordomyrma infundibuli* sp.n.

♂. Darker or lighter brown, mandibles, funiculi, tibiae, tarsi, articulations of antennae and joints of legs, apex of scapes, femora and spines dirty yellow. Whole body shining, with widely separate shallow setigerous punctures, raised in front, and clothed with longer and shorter scattered erect brown hairs, funiculi and tibiae with closer short subdepressed yellow hairs, clubs and apex of neck with abundant very fine and short decumbent yellowish-white hairs.

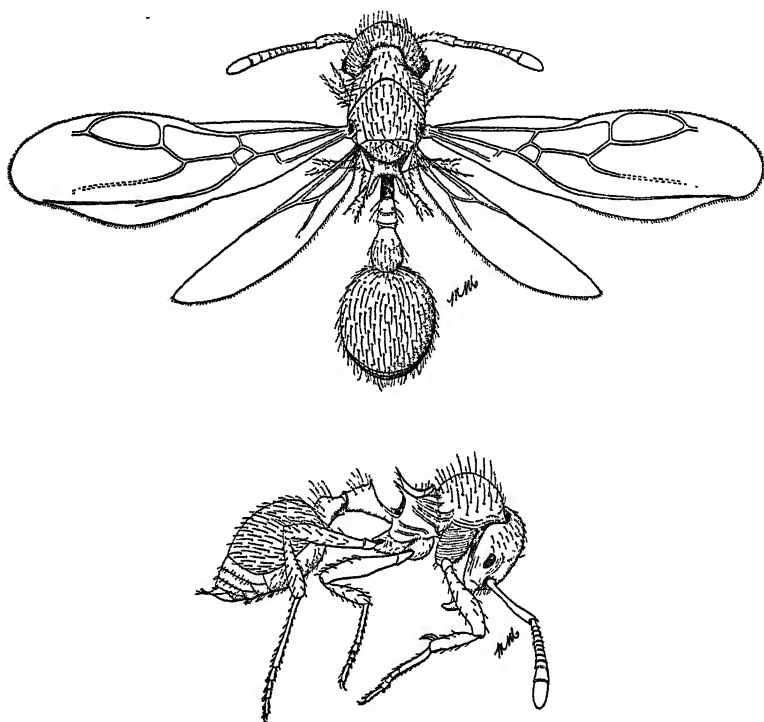
*Head*, not counting mandibles, subquadrate, posterior border somewhat deeply excised to receive neck, but almost straight when seen from above, posterior angles rounded; *mandibles* large, triangular, masticatory border armed with two sharp, longer teeth at apex, followed by five small teeth or dentules, very finely and closely punctured at base, the rest with small and scattered punctures; *clypeus* with anterior border rounded, projecting posteriorly between the antennal carinae, with two finely raised lines on each side, smooth and shining between; *frontal area* not clearly defined, longitudinally striate; *cheeks* and anterior portion of head before and beside eyes longitudinally striate; *antennal carinae* with a sharp edged lobe convergent behind and then diverging in a narrow raised line, continued for two-thirds of the length of the head; *antennae* 12-jointed, *scape* not reaching posterior angles of head, *funiculi* gradually increasing in breadth, with a three-jointed *club* a little longer than the rest taken together; first joint longer than broad, triangular, as long as the next three taken together, joints 2-7 transverse, last joint of club long, bluntly pointed, as long as the two preceding taken together; *maxillary palpi* 4-jointed, *labial palpi* 3-jointed; *eyes* longer than broad, slightly narrowed anteriorly. *Thorax* robust, broader anteriorly than posteriorly, no distinct suture between *pronotum* and *mesonotum*, which form together a very convex round surface; *pronotum* strongly margined at sides and with anterior angles bluntly rounded; *meso-epinotal furrow* wide and deep, coarsely longitudinally striate, the striae continuing along the sternites of thorax and sides of *epinotum*; *epinotum* with anterior border raised in an angle and margined, dorsal surface margined, slightly concave and when tilted evidently transversely striate, *spines* fairly long, straight, divergent, sharply pointed, *declivity* abrupt, circularly striate and armed with two short, sharp teeth at base; *petiole* with a long peduncle; node high, terminating in a sharp point at anterior end, with several transverse raised lines on posterior dorsal surface, forming slight projections at sides, posterior border with raised margin; *post-petiole* longer than broad, with raised transverse lines forming one or two projections at sides, and a raised ridge above, a short projecting tooth at anterior end of ventral surface. *Gaster* short, oval, first segment forming greater part of the same. Anterior *coxae* strongly transversely striate; *legs* long, *femora* and *tibiae* spindle shaped, no spurs to intermediate and posterior tibiae. *Long.* 3.7 mm.—4 mm.

♀. Colour, structure, puncturation and hairs much as in the ♂. *Eyes* larger and more prominent, *ocelli* present. *Thorax* with very distinct sutures between *mesonotum*, *praescutellum* and *scutellum*. *Parapsidal furrows* reaching basal



margin of mesonotum. *Spines* somewhat thicker and slightly curved inwards. *Wings* somewhat dusky and thickly covered with short dark hairs, *anterior wing* with one small *discoidal cell*, one long closed *cubital cell*, and one closed *radial cell* slightly shorter than the *cubital cell* and appendiculate at apex. *Long.* 4.5 mm.

Type and ♀ type in B.M. Collection.



*Lordomyrma infundibuli* sp.n.; above, ♀; below, ♂.

Described from 5 ♂♂ and 1 winged ♀ taken by Miss L. E. Cheesman, Dutch New Guinea, Jutefa Bay, Pim, ii.1936. The ants were found in clay among the roots of an uprooted tree. The nest was on a horizontal face, with a funnel entrance.

This is the first time a female has been described in this genus. The species described above is unlike all the known species, differing in size, structure, etc. The genus *Lordomyrma* was created by Emery in 1897 for the reception of *Podomyrma caledonica* André from New Caledonia, and two new species, *L. furcifera* and *L. cryptocera*, which he described. In 1912 Stitz described a variety of *L. cryptocera* Emery from New Guinea under the name var. *accuminata*. In 1919 Wheeler described *L. leue*, ♂ and ♀, from

Lord Howe Island, and *L. punctiventris*, ♂ and ♀, from Queensland. He gave a table of the species and cited *Podomyrma caledonica* André as the type of *Lordomyrma*. In this, however, he was incorrect, as he had already cited *L. furcifera* Emery as the genotype in 1911. In 1923 Menozzi described a new species, *L. crawleyi*, from Humbolt Bay, New Guinea. This species has a spine on the post-petiole as well as on the petiole. In Wheeler's figure of the forewing of one of his males, the radial cell is closed, but not appendiculated as in our female. He took *L. punctiventris* in a small cavity in a rotten log in the dark tropical scrub at Kuranda, Queensland, and says that in life these ants are sluggish and timid.

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British Museum (Natural History),  
 London, S.W.7.  
 December 1st, 1939.

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#### Society.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: November 4th, 1939.—Mr. F. Stanley Smith, Vice-President, in the Chair. This was the first meeting to be held in the new meeting place, and some sixty members were present. Mr. S. G. Wallis Norton exhibited hibernating larvae of *Hipparchus papilionaria* L., from ova, and a series of *Lithosia griseola* Hb. including ab. *flava* Haw. Mr. H. W. Andrews, the local Diptera *Porphyrops antennata* Carl. and *Thinophilus flavipalpis* Zett. Mr. F. D. Coote, the Psychid *Taleporia bombycella* Hb., bred from Abbot's Wood, and remarked on the classification of the Psychidae; *Comibaena pustulata* Hufn. (*bajularia* Schiff.) from the Liphook Field Meeting; a photograph of the local Orchid *Epipactis violacea* Sov. found in a West Sussex wood. On behalf of Mr. F. W. Frohawk, Mr. Coote, two *Aglais urticae* L. ab. *nigra* Tutt, E. Farleigh; *Euchloe cardamines* L. ab. *maculata-punctata* Tutt, Broadstairs, 17.iv.39, and a gynandromorph from Swindon; *Colias croceus* Frery ab. *pallida-obsolata* Tutt, Broadstairs. Mr. J. O. T. Howard, an intersex of *Malacosoma castrensis* L. and an ab. *pallida* Tutt, Southend; bred ♀♀ of Cornish *Cosmotriche potatoria* L. Dr. G. V. Bull, ab. *unicolor* Tutt of *Malacosoma castrensis* L., N. Kent, and the Ichneumon *Rhyssa persuasoria* L. Mr. T. R. Eagles, egg parasites of *Amorpha populi* L.; *Ptinus tectus* Boi. (Col.) infesting fish food; bred *Agrotis agathina* Dup., Witley, and *Palimpestis fluctuosa* Hb., Tilgate Forest. Mr. G. B. Oliver, ♀ *Colias croceus* Frery with hindwings approaching ♀-form *helice* Hb. in colour; colour aberrations of the hindwings of *Argynnis cydippe* L., Sussex origin. Mr. A. A. W.

Buckstone, various bred and captured forms of *Polygona c-album* L. and gave notes on the variation; aberrations of *Pyrameis cardui* L., *Polyommatus icarus* Rott., *P. bellargus* Rott. and *P. coridon* Poda. Mr. E. E. Syme, the earwig *Apterygida albipennis* Megerle. Mr. S. Wakely, a varied bred series of *Nonagria sparganii* L., Isle of Wight, and a yellow *Pieris napi* L. Mr. R. J. Burton, larvae of *Perisoma taeniata* Steph., N. Lancashire.—HY. J. TURNER.

## Reviews.

'GUIDE TO THE COLLECTION OF BRITISH ACULEATE HYMENOPTERA.' By HOWARD M. HALLETT, F.R.E.S. 8vo, pp. 28, paper covers. Published by the National Museum of Wales and the Press Board of the University of Wales, Cardiff. 1939. Price 4d.

This booklet is far more than just a guide to the bees, wasps and ants in the National Museum of Wales. It would form a very useful introduction for students and general naturalists who can never even get to Cardiff. The collection Mr. Hallett has assembled and so carefully arranged is not only the main basis of our present knowledge of the South Welsh Hymenoptera Aculeata from his own collecting, but includes many insects from other parts of Britain, notably the collection of the late Dr. Philip Mason (Burton-on-Trent) and the collection (mostly from West Suffolk) of the late Col. C. G. Nurse, so that ninety per cent. of the British bees, wasps and ants are represented. A list of books for further study occupies one page and another is devoted to instructions for collecting. Throughout the booklet the life histories of the insects receive more attention than the differences between dead ones—a token of the attitude of the modern museum curator.—R.B.B.

'REPORT ON INSECT PESTS OF CROPS IN ENGLAND AND WALES, 1935-1937.' Ministry of Agriculture and Fisheries. Bulletin 118. 8vo, pp. vi+64, 1 map. 1939. Price 1s. 0d.

This Report follows closely the plan of its predecessors and contains much usual information. Recent developments in methods of control and in the progress of research on insecticides are briefly reviewed and references to further information given. During the period discussed numerous foreign insects were intercepted by the Ministry's inspectors in the course of routine examination of imported plants. Single specimens of the Colorado beetle (*Leptinotarsa decemlineata* Say) were discovered on five occasions, but no outbreak occurred. The asparagus fly (*Platypharea poeciloptera* Schr.), which had not previously been detected in England, was discovered in Hertfordshire in 1935, and subsequently found to be fairly widely distributed in that county. The major portion of the report consists of an extensive series of records in tabular form of the occurrence of insect pests as supplied by Advisory Entomologists and other reporters. A list of 234 references to literature, arranged under the heading of crops attacked, and an excellent index greatly enhance its usefulness.—E. TAYLOR.

'CLASSIFIED INDEX OF ENTOMOLOGICAL CONTRIBUTIONS TO THE "SCOTTISH NATURALIST" FROM ITS COMMENCEMENT IN 1871 TO THE END OF 1938.' By PERCY H. GRIMSHAW, I.S.O., F.R.S.E., F.R.E.S. 8vo, pp. 66. Published by Oliver and Boyd Ltd., Edinburgh. Price 2s. 0d.

This Index was published in the *Scottish Naturalist* from July to November, 1939, and has now been issued in complete form consisting of 66 pages and cover.

## THE EFFECTS OF ANTS ON THE ACIDITY OF SOILS.

BY WALTER PICKLES.

## INTRODUCTION.

In the course of carrying out a survey of the populations of ants' nests at Thornhill, Yorkshire, since 1935, I was struck by the peculiarity of the soil of the mounds of the yellow meadow ant, *Lasius flavus* Fab. (5). I decided to ascertain whether or not there was any difference in the nature of the soil of which the mounds were constructed from that of the hillside where they were situated. It was decided to make a record of the difference in the pH of the soils of all three species of ant occurring on the hillside. They were *Lasius flavus* Fab., *Formica fusca* L. and *Myrmica ruginodis* Nyl.

## NATURE OF THE HILLSIDE INHABITED BY THE ANTS.

The hillside is very steep (about one in two) and is made up of loose flat stones under which the nests of the ants *Myrmica ruginodis* and *Formica fusca* are found. Scattered about are the mounds of *Lasius flavus*. The vegetation is chiefly bracken (*Pteris aquilina* L.), among which the grasses *Aira flexuosa* L., *Holcus mollis* L. and *Agrostis alba* L. grow. There are a considerable number of bramble stems intertwining among these. The mounds of *Lasius flavus* are usually thickly covered with *Aira flexuosa* with sprinklings of *Holcus mollis*.

## THE METHOD EMPLOYED IN THE INVESTIGATION.

Samples of soil were taken practically every week from the nests of all three species of ants from May until they were no longer active in the autumn. Two samples were collected from every nest, one sample of the nest soil and one of the soil nearby (in the case of *L. flavus*, soil having *A. flexuosa* growing upon it so that a proper comparison could be made). The soil was collected from the surface of the nests of *L. flavus* and just below the stones of those of *Formica fusca* and *Myrmica ruginodis*. It was taken home and samples of the soils were shaken with twice their volumes of distilled water previously neutralised to a pH of 7.0, and allowed to stand for eighteen hours. The liquid was then decanted off and tested in a Lovibond Comparator using the standard indicators mentioned by Clark (1).

## THE pH OF THE SOIL OF ANTS' NESTS.

In Table 1 there is given the record of the pH determinations made during the survey.

TABLE 1.—pH of the soils of the ants' nests and that of the soil of the hillside.

Date.	<i>Lasius flavus.</i>		<i>Myrmica ruginodis.</i>		<i>Formica fusca.</i>	
	pH soil of hillside.	pH of nest soil.	pH soil of hillside.	pH of nest soil.	pH soil of hillside.	pH of nest soil
13.v.39	4.6	5.3	4.2	4.5	—	—
20.v.39	4.4	5.3	4.0	4.6	5.0	4.3
10.vi.39	4.6	5.6	4.0	4.5	4.6	4.2
24.vi.39	4.0	4.0	4.0	4.0	4.1	3.8
1.vii.39	4.8	5.5	5.6	5.7	5.0	5.1
8.vii.39	6.1	6.0	6.2	6.2	6.2	6.0
15.vii.39	4.2	4.8	4.2	4.3	3.9	4.0
22.vii.39	4.4	4.9	4.5	4.3	4.3	4.3
31.vii.39	4.4	4.7	4.4	4.3	4.4	4.2
4.viii.39	4.7	5.0	4.4	4.6	4.4	4.3
8.viii.39	4.3	4.6	4.2	4.2	4.4	4.0
11.viii.39	4.6	4.8	4.6	4.4	4.6	4.4
25.viii.39	4.2	4.4	4.2	3.8	4.0	4.4
9.ix.39	3.8	4.6	3.8	4.4	4.0	4.1
16.ix.39	4.0	4.5	4.1	4.4	4.1	4.0
23.ix.39	4.0	5.4	4.0	4.2	4.2	4.0
30.ix.39	4.0	5.2	4.2	4.2	4.2	4.0
7.x.39	4.0	6.0	4.0	4.0	—	—
14.x.39	4.2	5.0	—	—	—	—
21.x.39	4.2	5.4	—	—	—	—
28.x.39	4.2	4.9	—	—	—	—

From these data, we can see that, in the case of *Lasius flavus* particularly, the soil of the nest mounds has a more alkaline reaction than that of the surrounding soil. This is in accordance with Janet's observations (3) that ants have an alkaline effect on the soil of their nests. Janet (3) also mentions that when pieces of red litmus paper were placed in the entrances of a mound of *Lasius* (species not mentioned), they were turned at least partly blue. This was not the case with pieces of red litmus paper which were placed in the entrances of the mounds of *Lasius flavus*. The soil being acid, the effects of the ants were not such as to counteract this acidity of the soil and turn the pieces of red litmus paper blue. Janet (3) does not state the type of soil on which his experiments were conducted, and it seems that, according to Walpole (6), litmus paper reacts differently according to its composition, whether heavily or lightly dyed, and in the presence of protein it tends to give a more alkaline indication than is really the case.

The difference between the pH of the soil of the hillside and that of the nests of *Lasius flavus* was greater after rain when there was new soil added, as described by Donisthorpe (2). This was probably due to the alkalinity of the saliva on the grains of soil that

have been used as building material; see Janet (3).

Pearsall (4) mentions soils having *Aira flexuosa* growing upon them which have a pH of 3.72. It seems probable that the difference in the pH of the mounds of *Lasius flavus* from between 4.0 and 6.0 is due to the working of the ants.

On the whole, the soils of the nests of *Myrmica ruginodis* have proved to be more alkaline than the surrounding soils. This may not be due entirely to the effects of the ants, but partly at least to the nature of the materials of which the nests have been constructed. This has consisted largely of the seeds of the grass *Aira flexuosa* mixed with soil, and in some cases it was found that there were small green pellets made of masticated grass in which *Holcus mollis* was identified.

With *Formica fusca* the pH record shows that on the whole the pH of the nest soil has been more acid than that of the surrounding soil. Again, since *F. fusca* has used as building material the seeds of *Aira flexuosa*, its own cocoon cases and small pieces of bracken fronds, this may not therefore represent the absolute effect of the ants on the soil.

Certainly, as these ants have used foreign matter in the construction of their nests, these materials as well as the saliva from the ants will have altered the pH of the nest soil.

#### ACKNOWLEDGMENTS.

I wish to thank the agent to the Savile Estate, Mr. C. A. E. Horton, for permission to use the land at Thornhill; Mr. H. Wright, Principal of the Technical College, Dewsbury, for the loan of a Lovibond Comparator and the use of the Chemical Laboratory at the College; Dr. J. Grainger, Curator of the Tolson Memorial Museum, Huddersfield, for assistance in identifying the grass in the pellets from the nests of *Myrmica ruginodis*, and Dr. T. W. Woodhead for identifying the grasses.

#### SUMMARY.

(1) A record of the differences in pH between the soils of the nests of three species of ants at Thornhill, Yorkshire, was made during the summer months of 1939.

(2) The soil of the mounds of the ants *Lasius flavus* is definitely more alkaline than that of the surrounding soil, exhibiting a greater difference of pH after showers of rain.

(3) The building materials of the ants *Myrmica ruginodis* and *Formica fusca* have included such things as the seeds of *Aira*

*flexuosa*, pellets of masticated grass and small pieces of bracken fronds and the empty cocoon cases. These must have had an effect on the pH of the soil of these ants' nests, so that the pH determinations of these ants' nests does not represent the absolute effect of the ants.

(4) On the whole, the soil of the nests of *Myrmica ruginodis* was more alkaline than that of the surrounding soil; that of the nests of *Formica fusca* more acid.

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23 Beech Grove Avenue,  
Garforth, Leeds.  
November 16th, 1939.

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*Conops (Leopoldius) signatus* Wied. (Dipt., Conopidae) taken in Cornwall.—On October 12th, 1939, I took a species of *Conops* on a hedgerow of the Penrose Estate, near Helston, which did not agree with other species of this genus in my collection. I showed the fly to Mr. R. L. Coe at the British Museum (Nat. Hist.) and he kindly submitted it to Mr. C. J. Wainwright, who has determined it to be a female *Conops (Leopoldius) signatus* Wied. I am very grateful to both Messrs. Coe and Wainwright. This considerably extends the known range of the species in this country and the date of capture is a month later than previously noted. It has been recorded from Berkshire, Suffolk and Worcestershire in August and September (see 1910, *Ent. Mon. Mag.*, **46**: 273; 1935, **71**: 179-181; and 1938, **74**: 85-89).—L. PARMENTER, F.R.E.S., 94 Fairlands Avenue, Thornton Heath, Surrey: February 8th, 1940.

*Dytiscus lapponicus* L. (Col.) in the Isle of South Uist.—Although for many years we have been collecting the aquatic Coleoptera of the Outer Hebrides, and have as a matter of fact examined all the major islands (except Benbecula), and many of the smaller ones, until 1939, none of our parties had encountered *Dytiscus lapponicus*. However, in August last year, whilst beating the luxuriant growth of heather, etc., surrounding Loch Iarras, a peaty lochan lying just above the 250 ft. contour line between Beinn Beag Tuath and Spin, I knocked out a dead and damaged specimen of this species. As the heather was covered with flood and drift refuse of varying types, the origin of the insect is obvious. This provides the first record for *D. lapponicus* in the Outer Islands.—J. W. HESLOP HARRISON, King's College, University of Durham: January 30th, 1940.

*The Gall-gnat Janetiella thymi Kieffer (Dipt., Cecidomyidae) on the Isle of Fiaray.*—This low island lies to the extreme north-west of Barra and must at times be subjected to the onslaught of terrible winds and waves from the Atlantic. In spite of this, it supports a goodly number of plants and insects. Amongst the former none is commoner than the Thyme (chiefly the form *Thymus britannicus* Ronn.), which shows enormous variation and supplies food to several species of Arthropoda; of these *Janetiella thymi* Kief. is one of the most important. As a general rule, in the Inner and Outer Hebrides, its congener *Janetiella thymicola* Kief. much outnumbers it. Nevertheless on Fiaray the present is much the commoner species. Unless, however, the galls are dissected in some numbers, a false idea of the relative abundance of the two forms would be obtained as the gall of the Eriophyid mite, *Eriophyes thomasi* Nal., decked with its hoary pilosity, likewise abounds and it closely resembles that of *J. thymicola*.—J. W. HESLOP HARRISON, King's College, University of Durham: January 30th, 1940.

*Brachycolus stellariae Hardy (Hem., Aphididae) in the Outer Hebrides.*—I have often been questioned about the occurrence of aphides in the Outer Hebrides by various people interested in the problems presented by Aphidid-borne virus diseases. I can assure such workers that this group is fairly well represented in the western islands. Amongst the 'green fly' collected last year was the present species, *Brachycolus stellariae*, which was remarkable for its rarity and discontinuous distribution. At no point on the islands does it gall *Stellaria Holostea* L., for that usually common plant is absent from the areas we have worked, or, at least, we have not yet detected it. Thus it is compelled to utilise species of the allied genus *Cerastium* as its food plant. Of that genus we have collected single plants of *Cerastium viscosum* L. and *C. vulgatum* L. on Vatersay, Barra and South Uist bearing its characteristic galls. Moreover, diligent search failed to reveal additional examples.—J. W. HESLOP HARRISON, King's College, University of Durham: January 30th, 1940.

*The habitats of Cicindela campestris L. (Col.) in the Inner and Outer Hebrides.*—Although no one seems to have recorded this Tiger-Beetle from the Outer Hebrides, we have captured it on Barra and Vatersay, in the one case on sandy ground near Loch St. Clair and in the other on the approaches to the sand dunes in the 'neck' of the island. On South Rona the beetle occupied an area composed of pure peat in the centre and was far from uncommon on similar ground on Raasay, as well as on moorland paths composed of a mixture of weathered gneiss and peat. In Scalpay we found it on old-established banks washed down by the burns in the north of the island, whilst on Rhum, Eigg, Muck and Soay, although some of the colonies occupied peaty patches on the moors, it was generally to be found on ground, more or less bare, composed of weathered sandstones, gneisses, etc.—J. W. HESLOP HARRISON, King's College, University of Durham: January 30th, 1940.

*Gerris aspera Fieb. (Hemipt.-Heteropt.), a species new to the Hebrides.*—Although I have taken *Gerris costae* H.-S. in every Inner and Outer Island visited, the only other species captured were *G. lacustris* L. taken on Raasay, *G. thoracicus* Schum. on Raasay and Scalpay, and *G. odontogaster* Zett. on Scalpay and Rona. However, in 1938 I was very pleased to capture the very rare species *G. aspera* in a small loch just west of Minshall on the Isle of Rhum, and in the past season on Loch Cliad on the Isle of Coll.—J. W. HESLOP HARRISON, King's College, University of Durham: January 30th, 1940.



*Bombus smithianus* White (Hym.) flying over the sea.—Last year, in July, whilst sailing in a fishing boat between the Isle of Flodday, just south-west of Vatersay, Outer Hebrides, and Sandray, south of Vatersay, a queen of this interesting species boomed swiftly past our boat. Flodday itself is a tiny island broken into halves of quite different types, the one inaccessible by ordinary means from the other. With considerable difficulty we landed on each half, and were very pleased to find that *Bombus smithianus* was flying on both, and industriously probing the Lousewort flowers. As the isle is relatively high, bare, wind-swept and drenched by spray and the huge Atlantic waves, which often dash completely over it, it seems wonderful how either the bee, or the three species of butterflies (*Argynnis aglaia* L., *Polyommatus icarus* Rott. and *Maniola jurtina* L.) we captured, maintain themselves.—J. W. HESLOP HARRISON, King's College, University of Durham: January 30th, 1940.

*Late Syrphidae* (Dipt.) in a North Lancashire garden.—During the spell of fine weather in the autumn of 1939 I took the opportunity of working the Diptera that were flying in the sunshine. The weather was exceptional, and we had only one really wet day, October 8th, between September 21st and November 21st, when I gave up for the season. The days were mostly bright and sunny, and the temperature above the average for this time of the year; this enabled me to record some late dates. Below I give a list of the species taken during this period in my small garden, with the dates (in brackets) of last specimens seen. These are generally much later than stated in G. H. Verrall's 'British Flies,' 8 (Syrphidae), and should be of interest, taken so far north as Grange-over-Sands.

*Platychirus manicatus* Mg., several (Oct. 6th); *P. peltatus* Mg., a number (Oct. 3rd); *P. clypeatus* Mg., few (Oct. 7th); *P. albimanus* F., abundant (Nov. 10th). *Xanthandrus comtus* Harr., one on Oct. 2nd; I have only seen this once before, Sept. 19th, 1926. *Melanostoma mellinum* L., few (Oct. 10th); *M. scalare* F., few (Oct. 6th). *Catabomba pyrastris* L., a number (Nov. 10th); *C. selenitica* Mg., usually common, but scarce this year (Nov. 6th). *Syrphus albobristatus* Flin., two only (Oct. 21st); *S. ribesii* L., very common (Nov. 15th); *S. vitripennis* Mg., common (Nov. 6th); *S. luniger* Mg., plentiful (Nov. 10th): I took two females with coalesced lunules; *S. balteatus* Deg., very common (Nov. 18th); *S. cinctellus* Ztt., fairly common (Oct. 15th); *S. latifasciatus* Mcq., few (Sept. 28th); *S. auricollis* Mg., few (Oct. 25th). *Baccha elongata* F., a number (Oct. 25th). *Ascia podagrica* F., few (Oct. 11th). *Rhingia campestris* Mg., a number in early October (Oct. 7th). *Eristalis tenax* L., abundant on ivy bloom (Nov. 16th); *E. pertinax* Scop., common (Nov. 6th); *E. arbustorum* L., common (Oct. 10th); *E. horticola* Deg., common (Oct. 13th). *Myiatropa florea* L., scarce, one on Sept. 21st. *Helophilus pendulus* L., common early October (Oct. 26th); *H. hybridus* Lw., one only Sept. 21st. *Syrirta pipiens* L., common early October (Oct. 25th). *Xylota segnis* L., few early October (Oct. 6th).

On October 21st I saw a number of Diptera flying round two fir trees in the garden at about fifteen feet from the ground. This is the lowest branch; and by attaching my net to a long pole I was successful in securing a sample of them. They only flew in the bright sunshine; if a cloud obscured the sun, they ceased and rested at the tip of the pine needles. I took a few each day and they proved to be: *Platypeza rufa* Mg., a number; *P. consobrina* Ztt., one only; *Fannia canicularis* L., many; *F. scalaris* L., many.

On October 23rd I took four *Platypeza atra* Mg. These were flying round a cupressus tree, and came much lower, 'as the branches are only a yard from the base. On November 10th to the 15th I saw plenty of *Fannia manicata* Mg. These never came down and were only to be taken flying round the fir trees. The Platypezidae are scarce flies in Lancashire, but I feel sure, with my limited experience, that if looked for in October—November high up in the trees they would probably prove to be more common than we suppose. I have to thank Mr. J. E. Collin for kindly naming these flies.—A. E. WRIGHT, F.R.E.S., 'Brunleigh,' Grange-over-Sands, Lancs.: February 6th, 1940.

*A Sphingid (Lep.) held by its Proboscis inside a Lily in Fiji.*—Early on the morning of 20th April, 1939, at the village of Nambavatu, Mathuata, Vanunu Levu Island, a hawk moth, determined by Mr. W. H. T. Tams for the Imperial Institute of Entomology as *Herse convolvuli* Linnaeus, was found with its proboscis firmly caught in the pistil and stamens of a *Eucharis* lily. The component galeae were disunited and the whole proboscis so securely held within the flower that, despite the violent exertions of its powerful wings, the moth was unable to free itself. As the insect is strictly nocturnal, it had presumably struggled all the previous night and would doubtless have been taken later during the day by some bird, or by a bat that night, had it not been noticed. The lily is an introduction to Fiji and has reached native villages from European gardens.—R. A. LEVER, Department of Agriculture, Suva, Fiji: March 7th, 1939.

*A Ceratopogonid fly attacking a caterpillar in Fiji.*—Periodically every year, but especially in February and March and from June to September, leaves of the ornamental *Eranihemum* in Fiji are attacked by caterpillars of the Queensland leaf-butterfly *Doleschallia bisaltide* Cram. *australis* Feld. In February and March, 1939, the writer observed on Viti Levu some nearly full-grown caterpillars with a small fly settled on their upper surfaces. This proved to be a Ceratopogonid midge, determined by Dr. F. W. Edwards for the Imperial Institute of Entomology as *Forcipomyia hirtipes* de Meij. or closely allied species. The caterpillars, which pupated normally, and seemed none the worse for this phlebotomy, are provided with six stout, black spines per segment, each arising from an 'electric' blue boss and bearing stiff hairs on the sides and apex of the spines. At the base of these, between the bosses, one, two or, less often, three *Forcipomyia* were seen feeding, oblivious of the normal movements of the caterpillar, which made no attempt to rid itself of the parasite. No particular region seemed singled out except that only the upper surface and sides were attacked. An attempt to make the fly settle on one's hand pressed against a muslin-covered tube was unsuccessful. *Culicoides mollis* Edw. is the local species which attacks man without any assistance such as the above.—R. A. LEVER, Department of Agriculture, Suva, Fiji: March 7th, 1939.

[Species of the group of *Forcipomyia* to which *F. hirtipes* belongs have been observed in many parts of the world sucking caterpillars of butterflies and moths, usually large, smooth ones. No midges of other groups have been seen doing this, and no other feeding habits have been noted in the group of *F. hirtipes* (there are few, if any, established records of any *Forcipomyia* sucking vertebrate blood). There are two or three British representatives of this group, one of which (*F. pallida* Winn.) is not uncommon and has been recorded by Mr. T. B. Fletcher (1936, *Entomologist*, 69: 192) as sucking caterpillars of the brimstone moth at night. Further observations by British Lepidopterists on this subject would be of interest.—F.W.E.]

*SCRAPTIA TESTACEA* NOM. NOV. AND *S. FUSCULA* MÜLL.  
(COL., SCRAPTIIDAE).

BY A. A. ALLEN, B.SC., A.R.C.S.

A few months ago, in looking over my series of *Scaptia fuscula* Müll. from Windsor Forest, I noticed that two or three specimens appeared to differ from the rest in colour, sculpture, shape of thorax, etc. Further investigation has proved beyond doubt that there are two quite distinct though closely allied species hitherto confused under this name, which may be separated by the following table:—

*S. testacea.*

*Antennae* with joints 5—11 (especially the penultimate joints) longer in each sex than in the corresponding sex of *fuscula*; in ♂ about three times as long as broad, in ♀ twice.

*Thorax* less transverse, sides less strongly contracted towards the front from the middle or not far behind it, where it is normally broadest; posterior angles blunt; puncturation, especially in this region, very dense, interspaces very much narrower than the punctures.

*Elytra* more depressed, considerably widened posteriorly, at least in the female.

*Sculpture* of thorax and elytra very close, and these parts therefore duller; that of elytra finer and less rough, both the punctures and the interspaces smaller.

*Pubescence* very fine and close, the individual hairs shorter and thinner, mostly quite decumbent.

*Colour* lighter and brighter; elytra luteous or testaceous, thorax testaceous usually with a slight reddish tinge, head black; antennae yellowish-pitchy, palpi and base of antennae lighter or darker testaceous.

*S. fuscula.*

*Antennae* in ♂ as in ♀ *testacea*; in ♀ with joints 5—11 still shorter, especially the penultimate joints, which are not more than half as long again as broad.

*Thorax* more transverse, sides more strongly contracted towards the front from within the basal third or a little more, normally from the base; posterior angles well marked; puncturation, especially in this region, not at all dense, interspaces mostly much wider than the punctures.

*Elytra*, in mature and well preserved specimens, slightly convex, and parallel-sided or nearly so.

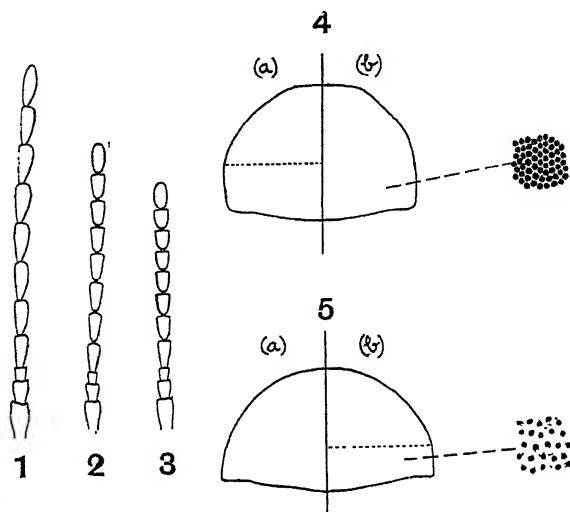
*Sculpture* of thorax and elytra not so close, and these parts therefore less dull; that of the elytra coarser and rougher, both the punctures and the interspaces larger.

*Pubescence* not so fine or close, the individual hairs longer and thicker, and more raised.

*Colour* darker and more obscure; elytra yellowish-brown to pitchy, thorax usually somewhat darker (never lighter), not much lighter than head, antennae black, palpi and base of antennae pitchy. (Immature or faded specimens are coloured more like *testacea*, but in these the head is brown instead of black.)

Of these characters, perhaps the most valuable and least comparative is the difference in the puncturation of the thorax near the hind angles, which is exceedingly plain under a moderately high magnifying power. That of colour is a useful guide, but should be used with caution, for although it may be fairly safe to assume that

a dark specimen is *fuscula*, the converse is by no means always true. When specimens are compared, the finer sculpture of the elytra in *testacea* is found to be very constant and distinct. The shape of the thorax varies somewhat in each species, but I have seen no examples in which ambiguity could arise even on this character alone.



FIGS. 1—3. Antennae. 1, *Scaptia testacea* mihi, ♂; 2, *S. testacea* mihi, ♀, or *S. fuscula* Müll., ♂ (these being exactly similar); 3, *S. fuscula* Müll., ♀. FIGS. 4—5. Outline of separate halves (a, b) of thorax in order to show the common range of variation in shape: (a) is the more typical form in each case. At the side is shown an example of the puncturation, on a somewhat larger scale, from the region indicated. 4, *S. testacea* mihi; 5, *S. fuscula* Müll.

The accepted synonyms of *fuscula* Müll. are *minuta* Muls. and *nigricans* Steph. It will be necessary to consider these three names.

I have been unable to consult the authors' types, and the earlier descriptions are mostly inconclusive, with the notable exception of that of Mulsant, which leaves no room for doubt that it applies to the species designated above as *fuscula*. It is given under the name of *minuta* Dej., for though Müller's name has priority his description is so vague, according to Mulsant, that it could apply to *S. dubia* Ol. As *minuta* Dej. is only a catalogue name not accompanied by a description, it is disposed of by Mulsant's having used it for the species he describes. It is true that it cannot be absolutely proved without actual examination that Müller's insect was the species to which I have applied his name in the above diagnosis,

following the majority of authors. I think, however, that it may be reasonably assumed as a fact on the consideration that, firstly, this species is by far the commoner of the two on the Continent (of the fifteen specimens standing over the name of *fuscula* in the British Museum (Natural History) Collection only two belong to the other species); and secondly, the name *fuscula*, while entirely appropriate to the darker species, would hardly have been given to the lighter one. Stephens describes his *S. nigricans* as being blackish, which could, of the two, refer only to *fuscula*: on the other hand, the *S. fuscula* of later British authors,\* as far as can be judged, and certainly of most of our collections, is the other species, which thus requiring a new name I have called *testacea* nom. nov.

In Britain *S. testacea* appears to be considerably the less rare, whereas on the Continent the reverse is evidently the case. (Incidentally *S. dubia* Ol., extremely rare in Britain, is the commonest species on the Continent.) Of the two species in question *fuscula* seems to be the first to have been found in Britain, as Stephens records his *nigricans* from Ripley, Surrey, on flowers in gardens. The earliest British exponents of *testacea* are presumably the two in the Power Collection from Purley and Esher, Surrey; the majority of the specimens in our collections are the same species, and are probably mostly from Richmond Park and Windsor Forest. In the latter place both species occur, *fuscula* being much the rarer; the first recent British examples known for certain are two taken there by Mr. Donisthorpe in 1927. My specimens of *fuscula* are a male and two females taken in July, 1935-37, by beating old oaks in this locality. *S. testacea* often occurs here under the same conditions; for particulars of the habits of this species, see Donisthorpe, 1939, Preliminary List of the Coleoptera of Windsor Forest, p. 98, and 1928, *Ent. Rec.*, 40: 12. In the genus *Scaptia* the males are apparently much rarer than the females; Mr. Donisthorpe's Windsor and Richmond examples are the only males of *testacea* that I have seen.

We do not yet know whether the two species have a similar distribution abroad. The two examples of *testacea* in the British Museum (Nat. Hist.) are from France.

63 Blackheath Park,

London, S.E.3.

November 17th, 1939.

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\* With the exception of H. E. Cox, who correctly describes the true *S. fuscula* under that name in his 'Handbook of the Coleoptera or Beetles of Great Britain and Ireland,' 2: 344 (1874)

ON THE HABITS OF *SCRAPTIA* (COL.).

BY H. ST. J. DONISTHORPE, F.Z.S., F.R.E.S., ETC.

In my experience, these insects are only about for a little over a fortnight; to be exact, the earliest date I ever took a specimen was on June 25th and the latest on July 13th. They breed in wood and woody fungus and often occur in trees infested by ants. Thus Perris found larvae in some numbers in the débris from a nest of *Acanthomyops fuliginosus* and some came to maturity. He also took several imagoes on an oak inhabited by a populous colony of the same ant. I have also taken it with ants in Windsor Forest; on June 30th and July 4th, 1926, it was not uncommon in an ash tree full of the ant *A. brunneus*, and I found it again with the same ant on July 4th, 1927. The beetles were always in the burrows and workings where the ants were thickest. It can generally be taken in hollow trees, and the late Miss Kirk devised a plan for capturing it in such situations. After covering the floor of the hollow with a sheet or piece of white paper, the sides, and when possible the roof, of the cavity can be gently brushed or swept with a dusting brush of soft feathers and the beetles are dislodged and fall on to the sheet. In this way we took quite a number of *Scaptia* at Windsor, also getting our first specimens of *Teredus nitidus* F., *Megapenthes tibialis* Lac. and *Xylophilus oculatus* Gyll. not uncommonly. On June 26th and 28th, 1926, we tried this plan in Richmond Park and captured a certain number of both *Scaptia* and the *Xylophilus*.

I also discovered that with this beetle the act of courtship takes place in the air, a fact that had never been published before. On July 13th, 1927, the evening being still and warm, several couples were captured on the wing and others were observed. They were flying gently through the air, the males being firmly attached to the females posteriorly, and both sexes were flying with the wings expanded.

## REFERENCES.

DONISTHORPE, H. 1926. *Ent. Mon. Mag.*, 62: 263.——— 1928. *Ent. Rec.*, 40: 12.PERRIS, E. 1876. *Ann. Soc. Ent. Fr.* (5), 6: 218.

British Museum (Nat. Hist.),

London, S.W.7.

November 20th, 1930.

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*Dumfriesshire Hymenoptera Aculeata*.—The following is a brief summary of the species of Aculeates I have encountered in south-eastern Dumfriesshire in recent years, chiefly in the parish of Gretna. *Myrmica laevinodis* Nyl., common in moist places. *M. ruginodis* Nyl., common in many places. *M. scabrinodis* Nyl., Gretna and Nutberry Moss, not rare. *Leptothorax acervorum* F., locally

common. *Lasius niger* L., local and not particularly abundant; I have it from Gretna, Rigg, Eastriggs, and Powfoot. *Formica fusca* L., plentiful everywhere. *Pompilus trivialis* Dahl. (*gibbus* F.), one swept by roadside, 20.vi. *Anoplius nigerrimus* Scop. (*niger* auctt.), one on a *Heracleum* head near Springfield, 16.vii. *Ceropales maculata* F., swept from heather on Newton Moss, a ♂ on 28.vii and a ♀ on 2.ix, both determined by Dr. O. W. Richards. *Ancistrocerus parietum* L., common in my garden in June and July. *A. pictus* Curt., also a frequent visitor to my garden from May to July: Springfield, 7.vi. *A. parietinus* L., uncommon along hedgerows in June. *Vespula vulgaris* L. and *V. germanica* F. are both equally common. *V. rufa* L., several at Figwort flowers by River Kirtle, 2.ix. *Trypoxylon figulus* L., one in my garden, 28.vi. *T. attenuatum* Sm., one ♂ swept from *Ranunculus* flowers on the dull afternoon of 14.vii. *Spilomena troglodytes* V. der Lind., one swept in a potato field, 26.vii. *Pemphredon lugubris* F. comes to my garden in June. *Cemonus shuckardi* Mwitz., one caught by roadside, 9.ix. *C. lethifer* Shuck., in my garden in June, rarely. *Crabro cribrarius* L., at flowers of Hogweed at Nutberry in July. *Coelocrabro capitosus* Shuck., odd specimens came to my garden in June and July. A ♂ at Springfield, 29.vi. *C. styrius* Kohl, a ♀ swept on Nutberry Moss, 3.vii. *C. leucostomus* L., in my garden in June and July, but hardly common. *Crossocerus palmipes* L., frequent in my garden in June and July, settling on the leaves of Black Currant bushes. *C. anxius* Wesm., also occasionally in the garden in June; one occurred so late as 11.viii. *C. elongatus* V. der Lind., in my garden in June and July. *Blepharipus dimidiatus* F., several near Springfield at *Heracleum* flowers in June and July. *Clytochrysis chrysostomus* Lep., one swept, Springfield, 5.viii. *Rhopalum clavipes* L., not uncommon, Nutberry Moss, 1.ix. *Colletes succincta* L., Newton Moss, at flowers of Heather in August, uncommon. *Halictus rubicundus* Chr., on Hawkweed flowers, etc., in September. *H. calceatus* Scop., common everywhere in May and again in autumn. *H. albipes* F., one on 17.x. *H. fratellus* Pérez (*freygessneri* Alf.), Gretna, Rigg, Newton Moss, etc., in May and again in August. *H. smeathmanellus* Kirb., one near Gretna at flower of Hawkweed, 16.ix. *Andrena haemorrhoa* F. (*albicans* K.), common in spring. *A. bicolor* Fab. (*gwynana* K.), at flowers of Dandelion in May. *A. jacobi* Perk., common on banks, etc., in spring. *A. fuscata* Smith, Newton Moss, 14.vi. *A. denticulata* K. is not uncommon about Springfield in July and August on Thistles, etc. *A. barbilabris* K. (*albicus* K.), at Dandelion flowers in May. *A. coitana* K., at flowers of Hogweed in July, not scarce. *A. tarsata* Nyl. (*analis* Panz.), somewhat local, but not rare on the moors. *A. subopaca* Nyl., Gretna, 12.v, one. *Nomada obtusifrons* Nyl., one swept in the evening of 15.vii near Springfield. *N. tormentillae* Alf., scarce, Nutberry Moss, 9.vii, and by the Black Sark burn, 16.vii. *N. flavopicta* K., near Springfield, on Ragwort, 26.vii. *N. marshalli* K. is the only *Nomada* I have met with in any numbers; it occurs at Sallows, Dandelion flowers, etc. *N. ruficornis* L., several specimens in May, but in different years. *N. flavoguttata* K., Springfield, 29.v; Gretna, 16.vii; uncommon. *Megachile centuncularis* L. visits my rose bushes not infrequently and makes its nests in old soft wood. *Chrysis ignita* L. occurs in June and July along sunny walls and banks, but is hardly common. *Pseudogonalos hahni* Spin., I have taken half a dozen specimens under varying circumstances and in different years, but always in July; apparently very rare in Britain. Other species must occur, but this district is not good for Aculeates and the past few seasons have also been unfavourable. My thanks are due to Drs. R. C. L. Perkins and O. W. Richards for their aid with my determinations.—JAS. MURRAY, 6 Burnside Road, Gretna, Dumfriesshire: January 20th, 1940.

# A SYNOPSIS OF THE BRAZILIAN SPECIES OF *MICROCYLLOEPUS* (COLEOPTERA, ELMIDAE).

BY H. E. HINTON, PH.D.

At the time of writing only two species of *Microcylloepus* Hinton have been recorded from Brazil, *M. inaequalis* (Sharp) and *M. longipes* (Grouv.). Specimens of both these species are before me from Brazil: Santa Catharina, Nova Teutonia, 1934-1936 (F. Plaumann). In this paper five new species are described, thus bringing the total of Brazilian species up to seven.

All the illustrations were done with the aid of a camera lucida; and lines next to figures refer to a length of 0.20 mm.

## A KEY TO THE BRAZILIAN SPECIES OF *MICROCYLLOEPUS*.

1. Cuticle moderately pale rufo-piceous to brownish-testaceous. Elytra with a large transverse tubercle on each side of scutellum. Femora entirely clothed with very fine and dense tomentum. Manaus ..... *M. pustulatus* sp.n.
- Cuticle black or at most very dark rufo-piceous and frequently with the elytral humeri reddish. Elytra without a tubercle at base on each side of scutellum. Femora nearly always with at least apical fourth free of tomentum ..... 2.
2. Epipleura without tomentum ..... 3.
- Epipleura with at least basal region tomentose ..... 4.
3. Males with ventral apex of first segment of front tarsus strongly, acutely produced and apex of produced portion with a long acute spine; inner spur of hind tibia very long, slender, and strongly curved forwards. Females with a moderately strongly gibbous area near middle apex of fifth abdominal sternite. Nova Teutonia ..... *M. spinipes* sp.n.
- Males with ventral apex of first segment of front tarsus not produced; inner spur of hind tibia short and nearly straight. Females with middle area near apex of fifth abdominal sternite not gibbous. Mexico, Guatemala, Brazil (Nova Teutonia) ..... *M. inaequalis* (Sharp).
4. Pronotum with numerous granules on basal three-fifths of disk. Elytra entirely black; fourth interval feebly convex near base. Nova Teutonia. .... *M. granosus* sp.n.
- Pronotum with disk entirely punctate. Elytra with the humeri reddish brown; fourth interval flat ..... 5.
5. Species large, 2.0 mm. or more. Disk of pronotum without a distinct carina in front of scutellum. Elytra with third interval near base very strongly convex. Nova Teutonia ..... *M. grandis* sp.n.
- Species small, 1.8 mm. or less. Disk of pronotum with a distinct though low median carina in front of scutellum. Elytra with third interval near base feebly to moderately strongly convex ..... 6.
6. Epipleura tomentose only up to posterior margin of metasternum. Males with dorsal side of front and middle tibiae gibbous near middle. Nova Teutonia ..... *M. plaumanni* sp.n.
- Epipleura tomentose up to middle of third abdominal sternite. Males with dorsal side of front and middle tibiae not gibbous. Nova Teutonia, Theresopolis ..... *M. longipes* (Grouv.).



**Microcyloepus pustulatus, sp. n.**

*Female*: Length, 1.78 mm.; breadth, 0.74 mm. Cuticle shining and moderately pale rufo-piceous; antennae, mouth-parts, and legs brownish-testaceous.

*Head* without distinct impressions; surface very finely and densely punctate, nearly asperate and with a few round punctures (about two-thirds as coarse as facets of eyes), which are usually separated by one or two diameters. Clypeus with fronto-clypeal suture distinct and so formed that front of head is moderately deeply, arcuately emarginate for its entire breadth; anterior margin nearly truncate and angle on each side broadly rounded; surface sculptured as front of head but with coarse punctures slightly denser. Labrum with anterior margin at middle broadly, feebly, arcuately emarginate; surface with punctures finer than fine ones of clypeus and also denser. *Pronotum* across broadest point, which is at basal two-fifths, broader than long (0.58 mm. : 0.54 mm.) and base broader than apex (0.54 mm. : 0.43 mm.). Sides broadly and moderately deeply sinuate at apical two-fifths and scarcely noticeably sinuate before basal angles. Sublateral carinae prominent, sharp, and extending from base nearly to apex. Disk with median depression broad, deep, navicular, well defined, and extending from apical third to a little beyond basal third; in front of scutellum flat for a distance equal to length of scutellum and in front of this flat region suddenly and very strongly convex; without a median carina in front of scutellum; oblique depressions present only laterally. Surface of disk with punctures as coarse to two-thirds as coarse as facets of eyes and separated by one to three diameters, though near base finer and sparser; sides between sublateral carinae and lateral margins punctate like basal area of disk. *Elytra* twice as long as pronotum (1.23 mm. : 0.54 mm.) and at broadest point, which is across apical two-fifths, broader than broadest point across humeri (0.74 mm. : 0.68 mm.). Epipleura without tomentum. Apices broadly, strongly produced and broadly conjointly rounded. Striae absent except on basal sides, where they are indistinct. Strial punctures on disk indistinct, irregular in shape, and not more than half as broad as intervals; surface of intervals punctate slightly more coarsely than pronotum and with the punctures very irregularly distributed, though generally separated by one to two diameters. Base of elytra behind scutellum with a deep, oval depression including first two intervals; base on each side of scutellum with a large transverse tubercle which is about half again as broad as scutellum and has posterior face moderately concave; third interval feebly convex for a short distance behind tubercle. Outer carina prominent and extending nearly to apex; inner carina less prominent and distinct only on basal half. *Scutellum* flat, subovate, and longer than broad. *Prosternum* when seen from side with anterior three-fifths (not including process) gradually and moderately bent ventrally; prosternal carinae present on basal four-fifths, slightly broader than process at base and feebly diverging anteriorly. Hypomera densely asperate on posterior fourth, elsewhere punctate like sides of pronotum. *Metasternum* with median longitudinal line broad posteriorly, narrower anteriorly, and extending to anterior fifth; disk on each side of median line feebly convex, without depressions; carina on each side of disk prominent, nearly straight, and complete; surface of disk punctate like elytral intervals and also feebly and transversely rugose. *Abdomen* with middle of first sternite not depressed, non-tomentose, and with lateral carinae prominent and extending nearly to posterior margin of segment; surface of first segment on non-tomentose region punctate like pronotal disk, elsewhere

and that of other sternites entirely tomentose. *Legs* with dorsal and ventral sides of all femora entirely clothed with fine, dense tomentum. Claws stout and each with a feebly developed obtuse tooth at base.

*Male*: There is a single male before me that appears to belong to this species. It is externally similar to female except as follows:

(1) The tubercle on each side of scutellum is round rather than transverse and is relatively much smaller, being only two-thirds as broad as scutellum; and (2) the third interval is carinate behind tubercle for a distance of 0.16 mm. *Genitalia* with the median lobe broad and evenly narrowed to apex, which projects distinctly beyond apices of parameres.

*Type*: A female in the collection of the British Museum (Nat. Hist.). Brazil: Amazonas, Manaus, ix.1937 (*H. E. Hinton*).

*Paratypes*: 1 ♂ and 5 ♀ ♀ with same data as type.

*Comparative notes*: This may be immediately distinguished from all other described species by the prominent tubercle on each side of the scutellum.

### ***Microcylloepus spinipes*, sp. n.**

(Fig. 1)

*Male*: Length, 1.64 mm.; breadth, 0.68 mm. Externally very similar to *M. inaequalis* (Sharp) except as follows:

(1) The middle of head is very finely and sparsely punctate and sides above eyes very densely punctate, whereas in *inaequalis* the entire head is very densely punctate to alutaceous and there are a few sparse, distinct granules; (2) mesosternal disk with the posterior angles strongly produced posteriorly and laterally to partly cover middle coxae, whereas in *inaequalis* they are rectangular or at most very feebly produced; (3) posterior side of mesosternal disk has a patch of numerous fine, long hairs, while in *inaequalis* this region is glabrous; (4) the whole metasternal disk is much more deeply depressed and the impression on each side more distinct; (5) the apical middle part of the fifth abdominal sternite is moderately gibbous instead of flat; (6) the legs are proportionately longer and more slender; (7) the ventral apex of the first segment of the front tarsus is strongly and acutely produced and apex of produced portion has a long and acute spine, while in *inaequalis* the apex of this segment is not produced; (8) the inner spur of the hind tibia is very long, slender, and slightly curved forwards instead of short and nearly straight; and (9) the apex of the median lobe of the genitalia has numerous long hairs instead of being glabrous.

*Female*: Externally similar to male except as follows:

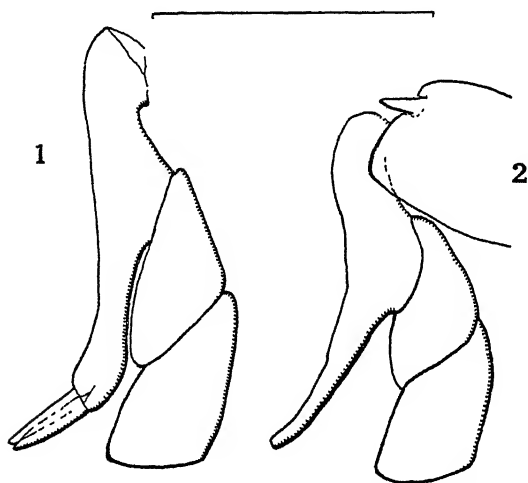
(1) The produced sides of the metasternum have no patch of long hairs; (2) the metasternal disk is less strongly depressed; (3) the anterior apex of first segment of front tarsus is not produced; and (4) the inner spur of hind tibia is short and nearly straight.

*Type*: A male in the collection of the British Museum (Nat. Hist.). Brazil: Santa Catharina, Nova Teutonia, 1936 (*F. Plaumann*).

*Paratypes*: 3 ♂ ♂ and 11 ♀ ♀ with same data as type.

*Comparative notes*: This species is perhaps even more closely

related to *M. distortus* (Sharp) known only by the unique male type from Guatemala. It may be distinguished as follows: (1) the middle part of the head is without granules; (2) the disk of metasternum has on each side a deep depression, whereas in *distortus* there is no distinct depression here; (3) the produced ventral apex of the first segment of the front tarsus is a different shape and has a distinct spine at apex, while in *distortus* there is no distinct spine (*vide* figs. 1-2); and (4) the inner spine of the hind tibia is very long and slightly curved forwards, while in *distortus* this spine is short and nearly straight.



FIGS. 1—2. (1) *Microcylloepus spinipes* sp.n. Lateral view of first segment of front tarsus. (2) *M. distortus* (Sharp). Lateral view of first segment of front tarsus.

### ***Microcylloepus granosus*, sp. n.**

*Female*: Length, 2.26 mm.; breadth, 0.90 mm. Cuticle shining and black to very dark rufo-piceous; antennae, mouth-parts and legs paler rufo-piceous.

*Head* without distinct impressions; surface with round to feebly oblong granules slightly finer than facets of eyes and usually separated by one to two diameters; surface between granules finely and extremely densely punctate, nearly asperate. Clypeus with fronto-clypeal suture distinct and nearly straight; anterior margin moderately deeply and arcuately emarginate for its entire breadth; angle on each side broadly rounded; surface sculptured similarly to that of head. Labrum feebly, broadly, arcuately emarginate at middle and angle on each side broadly rounded; surface without granules but with very fine (finer than finest of head) moderately dense punctures. *Pronotum* across broadest point, which is at basal two-fifths, not quite as broad as long (0.68 mm.: 0.71 mm.) and base broader than apex (0.60 mm.: 0.49 mm.). Sides broadly and moderately deeply sinuate at apical two-fifths and broadly and more shallowly

sinuate before basal angles. Sublateral carina prominent, inner side sharp, and extending from base very nearly to apex. Disk with median depression broad, moderately deep, well defined, and extending from transverse impression to basal third or slightly beyond; in front of scutellum surface gradually rising to highest point of disk at middle basal two-fifths; without a median carina in front of scutellum; oblique impressions moderately shallow and on middle line separated by a distance equal to two-thirds breadth of scutellum. Surface of disk with a belt near anterior margin which is densely and very finely punctate, behind this to transverse impression nearly smooth, and surface on bottom of median and part of oblique impressions smooth between granules; surface, except on disk anterior to transverse impression, everywhere with granules about as coarse as facets of eyes and separated usually by one to two diameters; surface between granules, except where already mentioned, with numerous fine punctures. *Elytra* twice as long as pronotum (1.50 mm. : 0.71 mm.) and at broadest point, which is across apical two-fifths, broader than broadest point across humeri (0.90 mm. : 0.87 mm.). Epipleura with a belt of tomentum extending to anterior margin of first abdominal sternite. Apices broadly, strongly produced and conjointly feebly rounded. Striae everywhere present, though feebly impressed on apical middle third; stria punctures on disk deep, round to subquadrate, usually slightly broader than intervals, and separated longitudinally by slightly less than their diameters. Intervals with third very strongly elevated for a short distance but feebly convex to apical half; fourth interval feebly but distinctly convex for a short distance; surface of intervals at base and basal sides granulate like pronotum and elsewhere with numerous fine punctures. Inner sublateral carinae prominent (as prominent as outer) and extending to apical fourth, while outer carina extends to produced portion of apex. *Scutellum* flat, subovate and longer than broad (0.13 mm. : 0.07 mm.). *Prosternum* when seen from side with all (not including process) of its length gradually and moderately bent ventrally; prosternal carina present on basal two-thirds, prominent, at base slightly broader than process, and feebly diverging anteriorly. Hypomera granulate like sides of pronotum and between granules asperate. Metasternum with median longitudinal line on posterior three-fifths deep and as broad as lateral discal impression, anteriorly much narrower, and extending to anterior sixth; disk on each side on posterior two-fifths with a moderately deep, obovate depression; surface of disk, particularly on bottom of lateral depressions, rugose and with dense, irregular, fine punctures. *Abdomen* with middle of first sternite depressed, the depression becoming deeper anteriorly; lateral carina of first sternite prominent, moderately curved inwards, and extending nearly to posterior margin of segment. Surface with a triangular area including middle of first three sternites non-tomentose, this area being set with punctures which are finer than facets of eyes and usually separated by one to two diameters. *Legs* with basal half of all femora tomentose.

*Male* : Unknown.

*Type* : A female in the collection of the British Museum (Nat. Hist.). Brazil : Santa Catharina, Nova Teutonia, iii.1936 (F. Plaumann).

*Comparative notes* : Its large size, granulate pronotal disk, absence of tomentum on the epipleura, very strongly convex third interval of elytra, feebly convex fourth elytral interval, and in-

wardly curving lateral carina of first abdominal sternite will serve to distinguish it immediately from all its congeners.

***Microcylloepus grandis*, sp. n.**

(Figs. 3-4.)

*Male*: Length, 2.0 mm.; breadth, 0.87 mm. Cuticle shining and black; humeri red-brown; antennae, mouth-parts, and tarsi rufo-piceous.

*Head* without distinct impressions; surface very finely, extremely densely punctate and also, particularly at sides, with an occasional granule which is two-thirds as coarse as facets of eyes and has a fine dorsal puncture. Clypeus with fronto-clypeal suture distinct and feebly curved; anterior margin broadly, arcuately, moderately shallowly emarginate for its entire breadth; angle on each side broadly rounded; surface sculptured like head but with the granules less numerous and distinct. Labrum with anterior margin nearly truncate and angle on each side broadly rounded; surface microscopically, transversely alutaceous and also with numerous fine punctures. *Pronotum* with broadest point, which is across basal two-fifths, slightly broader than long (0.68 mm. : 0.65 mm.) and base broader than apex (0.60 mm. : 0.51 mm.). Sides broadly and moderately deeply sinuate at apical two-fifths and broadly but slightly less deeply sinuate before basal angles. Sublateral carinae prominent, sharp, and extending from base very nearly to anterior margin. Disk with median depression broad, shallow, navicular, and extending from basal third to a little beyond scarcely noticeable transverse impression; oblique impressions broad, feeble, and mesally separated by a distance equal to slightly less than length of scutellum; disk in front of scutellum feebly and gradually raised to highest point at basal third; without a median carina in front of scutellum. Surface of disk with round to irregular punctures as coarse to a fourth as coarse as facets of eyes and confluent to separated by one diameter; surface on apical middle fourth with punctures frequently separated by three diameters; surface between sublateral carinae and lateral margins punctate as basal sides of disk. *Elytra* twice as long as pronotum (1.47 mm. : 0.65 mm.) and at broadest point, which is across apical half, slightly broader than broadest point across humeri (0.87 mm. : 0.79 mm.). Epipleura with a belt of tomentum which extends to produced apical portion of elytra or up to fourth abdominal sternite. Apices broadly, strongly produced and feebly, conjointly rounded, each being nearly obliquely truncate. Striae distinct except on middle apical third; stria punctures on basal half of disk deep, round, about as broad as intervals, and longitudinally separated by one to less than one diameter. Intervals with third convex on basal fourth and posterior to scutellum strongly convex for a short distance; surface of intervals with fine, dense, irregularly distributed punctures. Inner carina present on basal three-fifths and as prominent as outer, which extends to apical produced portion. *Scutellum* flat, subovate, and longer than broad (0.109 mm. : 0.09 mm.). Prosternum when seen from side with anterior five-sixths (not including process) gradually and moderately bent ventrally; prosternal carinae present on basal three-fifths, prominent, at base slightly broader than process, and feebly diverging anteriorly. Hypomera with posterior fourth asperate, elsewhere punctate like sides of pronotum and also rugose. Metasternum with median longitudinal line shallow but broad on posterior half, anteriorly narrower, and extending to anterior fifth; disk on posterior two-fifths on each side of median line with a

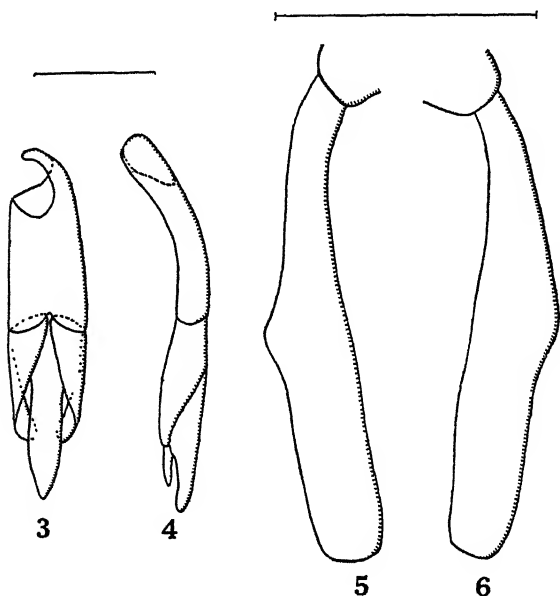
broad, oval, shallow depression; lateral carinae moderately prominent and nearly complete to hind coxae; surface of disk often rugose and with punctures slightly finer than facets of eyes and separated by one to two diameters. *Abdomen* with middle of first sternite feebly depressed anteriorly; lateral carinae prominent, straight and extending to posterior fourth of segment. Surface of abdomen tomentose except on middle of first sternite, which is with punctures slightly finer than facets of eyes and separated by two to three diameters. *Legs* with basal third of all femora tomentose. Claws stout and, as usual, not toothed.

*Female*: Externally similar to male.

*Type*: A male in the collection of the British Museum (Nat. Hist.). Brazil: Santa Catharina, Nova Teutonia, 1934 (F. Plaumann).

*Paratypes*: 7, with same data as type, but some collected in iii.1936.

*Comparative notes*: This resembles *M. granosus* Hinton, but may be distinguished by the punctate instead of granulate disk of pronotum, by the flat instead of convex fourth elytral interval, by the greater extent of the epipleural belt of tomentum, and by the straight instead of converging carinae of first abdominal sternite.



FIGS. 3—4 *Microcylloepus grandis* sp.n. (3) Dorsal view of male genitalia. (4) Left lateral view of same.

FIGS. 5—6. *Microcylloepus plaumanni* sp.n. (5) Lateral view of dorsal side of middle tibia of male. (6) Same of front tibia.

**Microcylloepus plaumanni, sp. n.**

(Figs. 5-6.)

*Male*: Length, 1.78 mm.; breadth, 0.60 mm. Cuticle shining and black; elytra with the humeri and a patch on each elytron at apical fourth near and including outer carina reddish-brown; antennae, mouth-parts, and legs rufo-piceous to brownish-testaceous. Externally similar to *M. longipes* (Grouv.) except as follows:

(1) The epipleuron is tomentose only up to posterior margin of metasternum whereas in *longipes* it is tomentose up to middle of third abdominal sternite; (2) the front tibia (fig. 6) has the dorsal side gibbous near middle, while in *longipes* it is here evenly convex; (3) the middle tibia (fig. 5) has the dorsal side also gibbous near middle instead of evenly convex; and (4) the hind tibia has the inner lateral side of a little more than apical third feebly concave and with a row of very fine, close teeth, whereas in *longipes* the tibia has no row of teeth and is not concave.

*Female*: Externally similar to male, but with the front and middle tibia not gibbous dorsally and hind tibia without a concavity or a row of teeth.

*Type*: A male in the collection of the British Museum (Nat. Hist.). Brazil: Santa Catharina, Nova Teutonia, iii.1936 (*F. Plaumann*).

*Paratypes*: 7 ♂♂ and 2 ♀♀ with same data as type but collected in 1934.

The elytra of all ten specimens are quadrimaculate. In about half the series of *M. longipes* before me, the apical reddish-brown areas of the elytra are very indistinct or completely absent.

Department of Entomology,

British Museum (Nat. Hist.),

London, S.W.7.

September 20th, 1939.

A NEW SPECIES OF *GABRIUS* STEPHENS (COL., STAPHYLINIDAE)  
FROM JAPAN.

BY THE REV. C. E. TOTTENHAM, M.A., F.R.E.S.

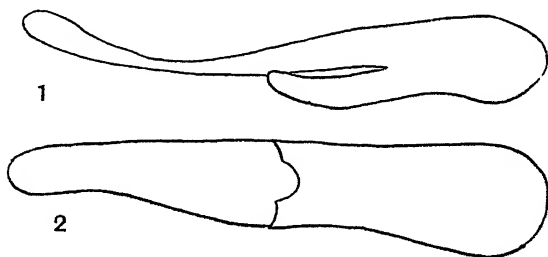
***Gabrius demarcatus* sp.n.**

Head and thorax black; elytra and abdomen pitchy-brown, the apical margins of the abdominal segments lighter; palpi reddish; antennae with the first two segments red, the remaining segments pitchy, the apical segment lighter; legs pale reddish-yellow.

*Head* quadrate, a little longer than broad, sides very feebly rounded, parallel, posterior angles obtusely rounded; eyes occupying about one-third of the sides of the head; vertex very feebly impressed anteriorly; on each side with a large puncture close to the inner margin of the eye, and with the median interocular puncture quite close to, but considerably anterior to, this puncture; several scat-

tered punctures in the postocular region; ground sculpture fine, transverse. *Antennae* with the second and third segments subequal, fourth to sixth slightly longer than broad, eighth to tenth transverse, but not strongly so. *Thorax* a little wider than the head, longer than broad, with the anterior margin rounded, anterior angles rounded, sides nearly straight, nearly parallel, feebly divergent posteriorly, posterior angles very obtusely rounded, base rounded; dorsal series each consisting of six punctures, of which the posterior two are closer together than the rest of the series; laterally with a row of four punctures and a few marginal punctures. *Elytra* wider than the thorax, a little widened behind, as long as together broad, puncturation close, moderate in size, not deep. *Abdomen* extremely finely, closely punctured.

♂. Sixth ventral segment triangularly excised in the middle of the apical margin, this excision being about as deep as wide. Aedeagus with the median lobe rather bulbous at the apex; the paramere at the apex divided into two very short, obliquely truncate lobes, separated by a small semicircle (see Figs. 1, 2).



FIGS. 1—2. Aedeagus of *Gabrius demarcatus* sp.n. 1, side view; 2, ventral view.

JAPAN: Nagasaki, 8.iv.1881 (*G. Lewis*).

*Type*, ♂, in the British Museum (Natural History).

A short series of this species was in the British Museum amongst the specimens of *Gabrius nigritulus* Gravenhorst. The specimens are from the Sharp Collection, and were labelled by Dr. Sharp 'nigritulus var.' In his 'Staphylinidae of Japan' (1889, *Ann. Mag. Nat. Hist.*, (6) 3: 40) Dr. Sharp states that 'the Japanese individuals . . . are far from agreeing exactly with our European varieties'; but the specimens in question are so different from *nigritulus* and its European allies that it is difficult to realise that Sharp did not notice that they belonged to a distinct species. They are easily distinguished from *nigritulus* by their distinctly larger size, lighter colour, longer head, finer puncturation of the elytra and abdomen, and by the aedeagus. In many respects this species is closely related to some of the North American species.

88 Station Avenue,  
W. Ewell, Surrey.  
October 7th, 1939.



## Reviews.

'BRITISH BLOOD-SUCKING FLIES.' By F. W. EDWARDS, Sc.D., F.R.S., H. OLDROYD, M.A., and J. SMART, Ph.D. Royal 8vo, pp. viii+156, 64 figs., 45 plates (44 in colour). Published by the Trustees of the British Museum, London. Price 15s.

This is a new and much enlarged edition of the 'Illustrations of British Blood-sucking Flies' published in 1906. Its enlargement may be judged from the fact that it gives details of 119 species compared with the 40 species of the previous edition, most of the additions being due to the increase in our knowledge of the species of Culicidae, Ceratopogonidae and Simuliidae. There are also 45 coloured plates compared with the previous 34, and numerous figures in the text. The section dealing with the Culicidae is an epitome of the information contained in J. F. Marshall's recent model monograph of the British species (also published by the Museum authorities) and is, therefore, complete and up-to-date, while the section on Simuliidae is based on the published researches of Dr. F. W. Edwards in this family. In view of the statement in the preface that the aim of the work has been 'to provide in the simplest manner information of interest to non-specialists,' it is particularly necessary to call attention to the fact that the section dealing with the blood-sucking members of the family *Ceratopogonidae* (the genus *Culicoides*) contains much original matter, while the entirely original piece of research work in 'Appendix A' in which the male genitalia of all the British species of this genus are described and figured is of outstanding importance to all specialists in this particular group of biting flies. The difficult task of sifting out the correct facts for a section on Tabanidae from a MS. left by the late Major E. E. Austen and various publications by British and continental authors has been successfully achieved by Mr. H. Oldroyd, and the following remarks are mainly supplementary rather than critical.

The genus *Tabanus* is used in its widest sense, and on p. 76, in a note on some of its sub-divisions, it is stated that 'owing to splitting up of the old genera *Theriopectes* and *Atylotus*, the British species formerly included in them have been transferred to *Siladynus* Enderlein and *Ochrops* Szilady.' This is not quite correct: the change in the application of the names *Theriopectes* and *Atylotus* is entirely due to the modern 'rule' that the citation of a genotype has priority over any other restriction of a genus, and in the case of at least *Theriopectes* the application of this rule works so unjustly that there is the strongest possible case for a request that it be suspended. The facts are as follows: *Theriopectes* was established by Zeller in 1842 and was divided by him into two groups of five and three species respectively; in 1876 Osten Sacken redefined *Theriopectes* in a diagnosis which would include all the species of Zeller's first group only, with the exception of the first species *tricolor*; in 1880 Brauer, in a classical monograph of the European species of *Tabanus*, not only adopted Osten Sacken's redefinition, but removed *tricolor* from the restricted genus *Theriopectes* and placed it in Osten Sacken's genus *Atylotus*; in 1911 Coquillett, either in ignorance of the work of Osten Sacken and Brauer, or (more probably) because he considered *Theriopectes* a synonym of *Tabanus* and its genotype a matter of no importance, cited as its genotype the very species Brauer had removed from the genus. Brauer's action was such a definite restriction of Zeller's genus *Theriopectes* that it ought to have been adopted by Coquillett, and the Zoological Commission should be asked for a ruling that *T. tropicus* L. be accepted as the genotype of *Theriopectes* and Coquillett's citation of *T. tricolor* Zell. be ignored.

*Haematopota italica* Mg. and *bigoti* Gob.—Verrall described both sexes of *italica* and females only of *bigoti*. His identifications are accepted in the volume under review, but it is quite certain that Verrall's *italica* male was not the true male of our *italica* females. The true male has been taken freely on the Essex coast since the appearance of Verrall's work and specimens were submitted in 1921 to Maj. E. E. Austen, who came to the conclusion that they were the *H. italica* var. *grandis* Mg. of Kröber, but failed to realise that our *italica* females were also more correctly referable to the same var. *grandis*; these males may be primarily distinguished by having the first antennal joint entirely covered with greyish dust. The male *italica* described by Verrall is almost certainly the male of our British *H. bigoti*, and I caught a second specimen at Walton-on-Naze (Essex) on July 15th, 1912, but whether our *bigoti* is the form originally described by Gobert is a question which has yet to be decided; it does not appear to be the same as the typical form redescribed by Kröber, if the character mentioned of a white hindmargin to the wings has any value, for the wings of our species have no white hindmargin.

*Tabanus bisignatus* Jaenn. and *tropicus* L.—The last paragraph on p. 92 is very misleading: the first line should read 'Until recently the light form of this species was included under the name *T. tropicus* of Linnaeus,' and later it should read 'Collin . . . and . . . Goffe have put forward the view that this supposed variety (*bisignatus* Jaenn.) is a good species distinct from *tropicus* L.' Presumably further on the words 'the form previously known as *tropicus*' refer to the 'light form of *T. bisignatus*' mentioned in the first line of the paragraph, but this form hardly requires a name considering that every gradation can be found in *bisignatus* from specimens without any sign of reddish coloration at the sides of basal abdominal segments to those with a small reddish patch on basal corners at sides of second segment (typical form), or on hind corners of first segment (a form also mentioned by Jaennicke), on to specimens with smaller or larger reddish patches on sides of both first and second segments. Even if a name were required for the light form it could not be *T. paganus* of Fabricius. In the original description of *paganus* the abdomen was described as 'fuscum, subtus cinereum, singulo segmento utrinque macula ferruginea adjacenteque nigra,' which Meigen translated as 'braun, unten aschgrau, auf jedem Ringe beiderseits ein rostgelber und dicht darneben ein schwarzer Flekken'; by no stretch of the imagination can this be said to apply to *T. bisignatus*, though it might apply to *T. glaucopis*. It is not improbable that the 'light form' of *bisignatus* was described by Macquart in 1826 as *T. bimaculatus*. Under *T. tropicus* mention is made of Duncan's record of this species. It must be remembered that *T. distinguendus* was often confused with *T. tropicus* by these earlier writers, and this was almost certainly the case in Duncan's record.

*Lipoptena cervi* L.—The notes on this species (which are practically a copy of those published in the previous edition) refer to a slender, winged form of the male, presumably such as is illustrated in the coloured figure of that sex, and one is led to infer that females of this form do not occur. This is not the case: both sexes may be of this form and appear to remain so until they have fed on the blood of their host. There is also a repetition of the remarkable statement in the earlier edition that 'the females all shed their wings in dying,' only altered to 'the females shed their wings on being killed.'

One finds but few typographical errors, but the reference to pl. 26 on p. 95 should be deleted, and there is a curious statement at the top of p. 92, 'particularly the darker form with the sidemargins practically absent.' The general

style of the volume is of the quality one has learned to expect in a British Museum publication, and, dealing as it does with flies both large and small which deliberately attack mankind, it should appeal to a larger number of people than do many entomological publications.—J. E. COLLIN.

'PRIMITIVE INSECTS OF SOUTH AUSTRALIA, SILVERFISH, SPRINGTAILS AND THEIR ALLIES.' By H. WOMERSLEY, F.R.E.S., A.L.S.  $6\frac{1}{2} \times 9\frac{1}{2}$  ins., pp. 322, 84 figs., 2 pls., paper covers. Handbook of the Flora and Fauna of South Australia, issued by the South Australian Branch of the British Science Guild (now incorporated with the British Association for the Advancement of Science), and published by favour of the Honourable the Premier (Hon. T. Playford, M.P.). 1939. Price 7s. 6d.

This is the first insect contribution to this handbook series; others on the ants (J. Clark) and on the moths and butterflies (Norman B. Tindale) are in preparation. The book is profusely illustrated, much more so than the 84 'figures' and two plates suggest, for many of the figures consist of a large number of drawings of whole or parts of insects, covering sometimes a whole page: Fig. 66, for example, is made up of 34 drawings lettered A—Z and AA—HH. Four orders are recognised: Thysanura, Diplura, Collembola and Protura. Simple and short dichotomous keys lead down from order through family, etc., to species, each group with its diagnosis and species with its fuller description. The keys to the major groups are not limited to the Australian fauna, so that the handbook includes a classification often as far as genera to the whole known world fauna. The Collembola, with their much greater number of species, occupy nearly two-thirds of the volume and are dealt with in rather more detail than the other orders. Chapters and tables are given to show the zoogeographical relationships of the Australian species. No fewer than 62 species (about 30 per cent.) appear to have been introduced into Australia. This number contains several of economic importance, the most serious of which is the Lucerne Flea or Clover Springtail (*Sminthurus viridis* L.), now one of the major pests of Australia. A selected bibliography for the world occupies nine pages. There is also a two-page glossary of technical terms and three pages devoted to hints on collecting and preserving.

The rapidity of the advance in the knowledge of the Australian insects of these orders since Mr. Womersley took up their study is shown by the fact that until 1932 no Protura had been recorded from Australia, though eight species and one variety are dealt with here, and that, whereas Tillyard in 1925 recorded only 40 or so Collembola, more than 200 are now known. One immediate reaction to this masterly work is a wish that the British fauna and flora could be dealt with in a similar series of handbooks. The last complete work on the British Apterygote insects, be it remembered, was Sir J. Lubbock's Ray Society monograph on the British Collembola and Thysanura in 1873!—R.B.B.

'THE SILVER FISH AND FIREBRAT.' British Museum (Natural History) Economic Leaflet No. 3. 8vo, 4 pp., 2 figs. 1939. Price: 1 copy,  $\frac{1}{2}$ d.; 3 copies, 1d.; 100 copies, 2s. 6d.

This leaflet, intended for use by the general public, covers the life-history, feeding habits and methods of control. The formulae of two suitable poisons are given: one includes sodium fluoride, pyrethrum and corn starch, the other sodium fluoride and flour.

A NOTE ON THE STRUCTURE OF THE EYE IN *AĒPUS*  
(COL., CARABIDAE).

BY EVERARD B. BRITTON, M.SC., F.R.E.S.

Dr. H. E. Hinton has recently called my attention to an observation on the eye in *AĒpus* in L. C. Miall's 'Natural History of Aquatic Insects,' 1895, p. 376. *AĒpus* is a genus of minute Carabidae, which is represented in this country by two species living in the intertidal zone. Miall describes a chitinous plate, with a round central hole, which covers and protects the eye, and suggests that this may function as a pinhole camera. The description of this structure is accompanied by figures drawn by Hammond, who first made the observation. From the number of facets in the eye in Fig. 114A, the species referred to is evidently *A. robinii* Laboulbène (now *Ālepopsis robinii* Lab., see Jeannel, 1922, *Ann. Soc. ent. Fr.*, 90: 168, 321). In an attempt to verify the observation, I have examined the examples of this species in the British Museum collections, as well as those of *A. marinus* Ström, and have failed to find any trace of the perforated chitinous eyeshield. There is, of course, a possibility that the plate is so fragile that it does not survive in dried specimens, but this would not agree with Hammond's figures, while Miall's use of the word 'plate' would scarcely be justified. Fig. 114C is impossible because it makes the outer surface of the whole eye, as well as that of each facet, concave. In the actual insect both are distinctly convex. Lastly, it may be observed that in the illustration of the whole insect (Fig. 113), there is no sign of the perforated plate on the eye.

It would appear certain, therefore, that the eye-shield of *AĒpus* is a myth, and in view of the fact that Miall's book is frequently used as a textbook, I have thought it advisable to correct this remarkable error.

British Museum (Nat. Hist.),  
London, S.W.7.

February 14th, 1940.

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NEW RECORDS OF INSECTS IN GRAIN STORES.

BY R. HOWE, B.SC., A.R.C.S., F.R.E.S.

At the request of the grain handling industry, an extensive scientific survey was made during 1938-39 of the infestation of grain and cereal products throughout Great Britain. A full and detailed report of the survey from both the scientific and industrial points of view will appear later. This brief note is intended to draw attention

to two species of quite widespread occurrence, not previously recorded from grain stores in this country. We should be pleased to hear of any further records of these species.

*Eurostus hilleri* (Reit.) (COL., Ptinidae).

Identified by Dr. K. G. Blair and Dr. H. Scott, who have informed me that it has been recorded previously only from Japan. Nevertheless, in March, 1939, this species was found to be widespread in Scotland.<sup>1</sup> It was taken on a variety of products in all kinds of grain store. Our records indicate that the species is established over a large area of Scotland, and it is hoped that another visit can be made to these districts to confirm this.

*Eurostus hilleri* (Reit.) is pitchy-brown in colour, rather variable in size, usually being about 3 mm. in length. The scutellum is indistinct; occasionally it appears to be just visible, but it is never as obvious as in *Ptinus* spp. *Eurostus* can be distinguished from *Tipnus unicolor* Pill. by the characters of the elytra. The punctures of the striae of *Tipnus* are deep, as broad as the interstices, which are slightly elevated. The punctures of the striae of *Eurostus* are shallow, less than half as wide as the interstices. The elytra of *Tipnus* are moderately thickly clothed with greyish pubescence; those of *Eurostus* bear a single row of golden setae on each stria and interstice. Rubbed specimens of *Niptus hololeucus* Fald. usually retain traces of the golden recumbent pubescence characteristic of that species, but such specimens can also be distinguished from *Eurostus* by the very indistinct striae of the elytra.

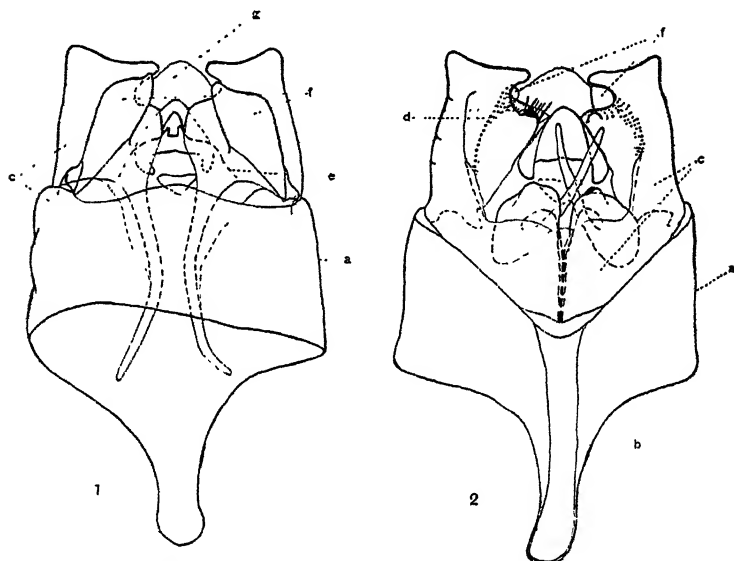
*Tinea insectella* Fab. (*misella* Zell.) and *T. ditella* Pierce & Metcalfe (LEP., Tineidae).

A number of species of Microlepidoptera were recorded on the survey. The specimens taken were frequently badly rubbed, so they were identified by the characters of the external genitalia, using the works of F. N. Pierce and J. W. Metcalfe. Included among the specimens collected in Yorkshire in July, 1938, was one male of *Tinea insectella* Fab.<sup>2</sup> from a farm granary. There were also quite a large number of another Tineid, the male genitalia of which did not correspond with any of the descriptions or figures included in Pierce and Metcalfe's work on this group (1935, The genitalia of the Tineid families of the Lepidoptera of the British Islands, Oundle, pp. 94-104, Pls. LVIII-LXIII).

<sup>1</sup> A few specimens were taken in Liverpool warehouses, March, 1940.

<sup>2</sup> A description, with three figures, of the male genitalia of the type specimen of *T. insectella* Fab. is given by A. Diakanoff (1938, *Tinea misella* Zeller ein Synonym von *Tinea insectella* Fabricius, *Tidjschr. Ent.*, 81 : 234-8).

Towards the end of August a moth was taken which by wing markings would have been identified as *T. insectella* Fab. On examination of the genitalia, however, this proved to be the 'unknown' species taken previously. Further specimens were therefore obtained and sent to Mr. Pierce, who kindly identified them as *T. ditella* Pierce and Metcalfe and drew our attention to their note on the species<sup>3</sup> (1938, 'The genitalia of the Pyrales with the Deltoids and Plumes,' p. 68). As no figure of the male genitalia of this species has yet been published, two drawings (figs. 1, 2) have been made by which it may be identified. The female is figured in Pierce and Metcalfe, 1935, Pl. LXII, under the name *T. misella* Zell. *T. ditella* has been recorded by us in several areas on a number of products and in all kinds of store.



FIGS. 1-2. — Genitalia of *Tinea ditella* Pierce & Metcalfe (aedeagus omitted). 1, dorsal view; 2, ventral view; a, ninth segment; b, saccus; c, valve; d, valvula; e, demarcation of valve ventrally; t, uncus lobes; g, membrane covering area between uncus lobes and ninth segment.

I should like to express my appreciation of the help which Mr. F. N. Pierce has given me with the identification of several species of Microlepidoptera.

Grain Survey, Imperial College Biological Field Station,  
Slough, Bucks.

February 14th, 1940.

<sup>3</sup> In this original description, Pierce and Metcalfe do not place the species in a named genus, but in one designated as Genus 14. The species is placed in the genus *Tinea* by Diakanoff in a footnote to the paper mentioned above.

FURTHER NOTES ON THE GENUS *POPILIUS* KAUP.  
(COL., PASSALIDAE).

BY JOHN R. DIBB, F.R.E.S.

In continuation of the preliminary notes on *Popilius* Kaup (1938, *Ent. Mon. Mag.*, **74**: 96-9) tables of species are given below under the species groups separated heretofore. Two species which were not referred to in the previous notes are now included. The first is *P. striatulus* sp.n. described below from five examples in the collection of the U.S. National Museum, Washington, which are temporarily in the writer's hands with other Passalidae sent for determination. *P. striatulus* belongs to the *striatopunctatus* group and is closely allied to *striatopunctatus* (Perch.). The second addition is *P. lenzi* Kuw., six examples having been recognised amongst other Passalidae kindly loaned by the British Museum. This is an interesting and quite distinct species known only from Cocos Island. It belongs to the *tetraphyllus* group.

***Popilius striatulus* sp.n.**

Nearly related to *striatopunctatus* (Perch.). Shorter and proportionately much narrower.

Inner tubercles large and prominent. Frontal carinae obsolete apart from the raised portion between central tubercle and inner tubercles, which portion is entirely smooth and shining. Pronotum not as prominent distad in middle line, lateral margins feebly hirsute, hairs not tufted; scars minute, sparsely punctate; median sulcus reaching anterior margin or within a fraction of a millimetre thereof; hair tufts of posterior angles wanting, only a few scattered hairs present. Scutellum strongly punctate. Dorsal punctures of elytra weak, lateral punctures smaller than in *striatopunctatus* (Perch.). Other characters agree with last mentioned species. Length 26 mm.

Type and four paratypes from Ecuador: Aloag, 2,900 m. alt., F. Campos R., in collection of U.S. Museum, Washington.

KEYS TO SPECIES OF *POPILIUS* KAUP.

*striatopunctatus* group.

1. Central tubercle large, apex extensively free ..... 2.
- Central tubercle of medium or small size, apex not extensively free.  
..... *brevioripennis* (Kuw.).
2. Robust species. Lateral margins of pronotum hairy, posterior angles with hair tufts, scars large, punctures in lateral striae of elytra large.  
..... *striatopunctatus* (Perch.).
- Form narrow. Lateral margins of pronotum almost hairless, posterior angles without hair tufts, scars small. Punctures in lateral striae of elytra small ..... *striatulus* sp.n.

*disjunctus* group.

- Monospecific ..... *disjunctus* (Ill.).

*recticornis* group.

1. More than 30 mm. in length ..... 2.
- Less than 30 mm. in length ..... 3.
2. Elytra not parallel, divergent distad; Mexican species .... *zodiacus* (Truq.).
- Elytra parallel; Guatemalan species ..... *championi* (Bates).
3. Frontal carinae very distinct; frontal area pitted and uneven; apex of central tubercle curved upwards. Pubescence pale straw coloured.  
..... *recticornis* (Burm.).
- Frontal carinae indistinct; frontal area smooth and only feebly punctate; apex of central tubercle approximately horizontal. Pubescence orange coloured ..... *wagneri* (Kaup).

*eclipticus* group.

1. 30 mm. or more in length ..... 2.
- Less than 30 mm. in length ..... 3.
2. Frontal carinae almost reaching and joining outer tubercles; a longitudinal impression immediately at foot of apex of central tubercle. From Costa Rica ..... *frantzi* Kuw.
- Frontal carinae distinctly separated from outer tubercles; no longitudinal depression immediately at foot of apex of central tubercle. From Mexico, Guatemala and Colombia ..... *eclipticus* (Truq.).
3. Frontal carinae forming a semi-circle. Size larger, 28.5 mm.  
..... *guatemalae* Grav.
- Frontal carinae strongly angulate. Size smaller, 27 mm. .... *varius* Kuw.

*tropicus* group.

- Monospecific ..... *tropicus* (Perch.).

*tetraphyllus* group.

1. Antennal club with three lamellae ..... 2.
- Antennal club with four lamellae ..... *tetraphyllus* (Esch.).
2. Antennal lamellae at least four times as long as broad. Dorsal striae of elytra strongly punctate ..... 3.
- Antennal lamellae not more than three times as long as broad. Dorsal striae of elytra very feebly punctate ..... *marginatus* (Perch.).
3. Thorax laterally extensively punctate, the punctures often spreading to disc ..... *mysticus* Bates.
- Sides of thorax with punctures limited to region of scars ..... 4.
4. Antennal lamellae longer. Mexican species ..... *klingshöfferi* (Kaup).
- Antennal lamellae shorter. Cocos Island species ..... *lensi* Kuw.

*intergeneus* group.

1. Frontal carinae sinuate ..... *sieberi* (Kuw.).
- Frontal carinae straight or crescentic ..... 2.
2. Antennal lamellae short. Pronotum sparsely punctate around scars. Scars on abdominal sterna extensively punctate ..... *amazonicus* Grav.
- Antennal lamellae long. Pronotum densely punctate around scars. Scars on abdominal sterna sparsely punctate ..... *intergeneus* Bates.

1 Moorland Grove,

Leeds 7.

December 16th, 1939.



THE GENUS *LEBIDEMA* (COL., CARABIDAE), WITH A DESCRIPTION  
OF A NEW SPECIES (*L. PELLUCIDA*) FROM PORTUGUESE  
EAST AFRICA.

BY EVERARD B. BRITTON, M.SC., F.R.E.S.

The genus *Lebidema* includes two known species, *L. clavicornis* Murray and *L. ruandensis* Burgeon, represented in the British Museum collections by the holotype and by three paratypes respectively. *Lebidema* is easily separable from the other two Lebiine genera of Chrysomeline facies (i.e. Lebiini with large, convex elytra), *Lebistina* and *Lebistinida*, in the following manner.

1. Fourth tarsal segments wider than the third segments and deeply bilobed ... 2.
- Fourth tarsal segments equal to the third segments in width, the fourth segments only emarginate at their apices ... *Lebistina* Motschulsky, 1864.
2. Elytral striae continuous, finely and uniformly punctured; elytral intervals unpunctured or only faintly punctured; head, pronotum and elytra testaceous or reddish in colour ..... *Lebidema* Motschulsky, 1864.
- Elytral striae interrupted, in the form of short impressed lines and punctures; elytral intervals each with two irregular lines of distinct punctures; colour metallic green or dark red with a metallic green reflection ..... *Lebistinida* Péringuey, 1898.

In the original description of *Lebistinida*, Péringuey notes as one of the characters distinguishing the genus from *Lebistina* the absence of 'punctures' (i.e. seta-bearing punctures) on the third elytral interval. I find, however, that these punctures (two in number, as in the other genera) are present. They lie close against the third stria and are made obscure by the broken condition of the elytral striae.

***Lebidema pellucida* sp.n.**

*Length*, 8-9 mm. Head, pronotum and elytra and the whole ventral surface of the body pale testaceous; antennae black, with only the proximal two-thirds of the basal segment testaceous; maxillary and labial palpi with the two distal segments piceous; the coxae and the greater part of the femora testaceous; tarsi, tibiae and apices of the femora piceous.

*Head* typical, depressed, with prominent hemispherical eyes, the surface of the head slightly rugose, with a few small scattered punctures, surface shining, without microsculpture; shape of the *pronotum* as in fig. 1, the median impression faint, the middle of the disc transversely rugose; the sides strongly explanate and moderately reflexed. *Elytra* large and convex, the striae faintly impressed, uniformly and finely punctured; surface of the elytra with uniform isodiametric microsculpture.

PORTUGUESE EAST AFRICA, Zambesi, Caia, 27.iii.1910 (*H. Swale*).  
*Holotype* ♂ and *allotype* in the British Museum.

The three known species of *Lebidema* may be distinguished as

follows:—

1. Elytral intervals each with two irregular rows of punctures; legs, including coxae, entirely piceous or black; antennae with the first, the third and the basal half of the fourth segments testaceous, remainder black (Uganda; Belgian Congo) ..... *ruandensis* Burgeon.
- Elytral intervals unpunctured; legs with femora testaceous except at apices, tibiae sometimes pale at base, remainder of the legs black; antennae black, with the three and a half basal segments or only part of the basal segment testaceous ..... 2.
2. Pronotum more transverse (fig. 1), ratio maximum width/length ca.1.52; tarsi, tibiae and apices of the femora black, remainder of the legs testaceous; antennae black with only the basal two-thirds of the proximal segment testaceous (Zambesi, Portuguese East Africa ... *pellucida* sp.n.
- Pronotum less transverse (fig. 2), ratio maximum width/length ca.1.44; tarsi black, tibiae testaceous at the proximal end, passing through brown to black at the distal end; femora testaceous, black at apices; antennae black, with the three and a half basal segments testaceous (S. Nigeria) ..... *clavicornis* Murray.

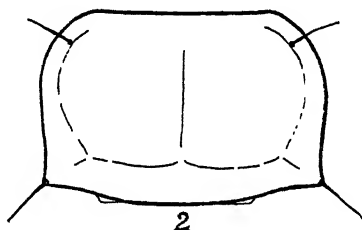
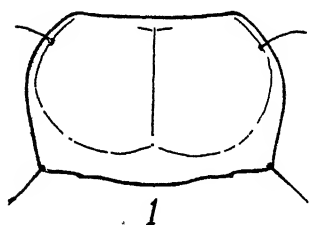


FIG. 1.—Pronotum of *Lebidema pellucida* sp.n.

FIG. 2.—Pronotum of *Lebidema clavicornis* Murray.

Department of Entomology,  
British Museum (Nat. Hist.),  
London, S.W.7.  
February 1st, 1940.

The two 'forms' of *Halipilus lineolatus* Mann. (= *browneanus* Shp.) (Col.) from the same Yorkshire locality.—So far as I am aware, there is as yet no published record of the occurrence of both *H. browneanus* and the 'form' *nomax* B.-B. from the same locality; though, where the range of these two meet (approximately on a line drawn from Chester to Hull), I have seen specimens of both from the same county or vice-county. However, on 11.viii.39 I took both the *browneanus* and the 'form' *nomax* in the same piece of water in the same 'dip.' This was in the West Lake at Bretton Park, near Barnsley, Yorks., S.W., visited by kind permission of the owner. After seeing the specimens, Professor F. Balfour-Browne wrote to me as follows: 'I agree with you that both forms of *browneanus* are represented in the two males. It is an interesting catch, but S.W. Yorks. is just on the edge of the range of both forms and no doubt they overlap a bit.' It would be interesting to know if any other coleopterist has had a similar experience.—E. J. PEARCE, Evanton, Ross-shire: March 8th, 1940.

## FOUR SPECIES OF COLEOPTERA NEW TO THE BRITISH LIST.

BY A. A. ALLEN, B.SC., A.R.C.S.

## STAPHYLINIDAE.

*Cryptusa capitalis* Mulsant & Rey.1873, Opusc. Ent., 15: 176 (*Meotica*).

Very small, narrow, linear and parallel-sided, depressed, finely pubescent and shining; piceous or pitchy-yellow, head (except mouth-parts) and middle of hind body darker, legs light yellow.

*Head* large, quadrate and parallel-sided, with a strong furrow extending from the vertex and widening out on to the front; more closely and strongly reticulate than rest of upper surface and slightly less shining, true puncturation obscure; eyes depressed. *Antennae* stout, shorter and of much more uniform thickness throughout than in *Meotica exilis* Er. and its allies, pitchy-yellow at base, darker towards apex; first three joints scarcely half as long again as broad, 3 triangular, 4 transverse, 5 slightly more so, 6 broader than 5, 6—10 of equal breadth, on an average about two and a half times as broad as long; last joint not more than twice as long as the preceding. *Thorax* very little shorter and scarcely wider than head, broadest about a third from apex and thence a little contracted to base, but with the sides not subsinuate as in *M. exilis*; finely and closely punctured, interspaces shining and almost smooth. *Elytra* longer and slightly broader than thorax, similarly sculptured. *Hind body* shining, reticulation distinct and not close; puncturation rather rough, moderately close at base and becoming gradually diffuse towards apex. *Legs* short. Length about 1.8 mm.

On 21st June, 1938, I captured a minute Staphylinid beetle crawling on the underside of a large stone embedded in the sand on the shore of the Thames estuary, Isle of Grain, North Kent. Finding it to be a species unknown to us, I sent it to Dr. Georg Benick, of Lübeck, the specialist in *Atheta* and allied genera, who returned it as the above species. He tells me that the insect is extremely rare, and, though very distinct, there is still some uncertainty as to whether it is the *M. capitalis* of Rey; and that he has seen a few examples identical with mine from various parts of Germany, and recently several from Chiasso in the extreme south of Tessin, Southern Switzerland. He also states that in his opinion, assuming the determination to be correct, it is not a *Meotica* at all, and that this genus requires clearer definition: with this I entirely agree, and have accordingly not hesitated to raise Mulsant and Rey's subgenus *Cryptusa* provisionally to generic rank. The subgenus was created (1875, Hist. Nat. Col. France, Brév. Aléoch., 4: 74) for the reception of this species alone, and characterised by the head being square and strongly furrowed. If the present anomalous species, which has very little in common with the rest, be excluded, the genus *Meotica* forms a compact and natural assemblage of closely allied species, having a triangular head, antennae strongly thickened

towards apex, and a close reticulation throughout; none of which characters are presented by *capitalis*. The anterior tarsi in my specimen, as far as I can make out, seem to be four- rather than five-jointed, but it is very difficult to be certain: if this is really so, the species would have to be removed from the Aleocharini to the Myrmedoniini, and I am inclined to think that it belongs near *Aleuonota*, etc., and may ultimately be located there; but the question is as yet far from being settled. Even in the recently issued Junk's Catalogue *M. capitalis* is placed as a synonym of *M. exilis*, together with no less than six other of Mulsant and Rey's species; an error scarcely to be explained, since not only do the two insects in question differ widely in almost every respect, but the description alone of the former admits of no doubt that they are not the same.

In a box of beetles sent by Mr. J. Hignett to Mr. H. Donisthorpe for identification I detected another example of *M. capitalis*. The captor kindly furnished me with the following details: he found it in a bag of decaying mill-refuse and sweepings, etc., outside Maesbury Hall Mill, not far from Oswestry (Shropshire), 18th October, 1936. Mr. Hignett is, therefore, to be credited with the first capture of the species in Britain. He suggests that it may be an inhabitant of the nests of small mammals, e.g. the water rat; it certainly appears to be subterranean in its habits, and, it would seem, riparian. Mulsant and Rey state that the only two specimens they had seen were found in the earth under faggot-wood, near Lyons. Mr. Hignett's specimen may well have strayed from the bank of the canal nearby to where it was found.

This very distinct insect cannot be confused with any other British species. Superficially, it has rather the aspect of *Atheta subtilissima* Kr., but the head, antennae, and hind-body sculpture are quite different.

*Atheta (Badura) puncticollis* G. Benick.

1938, Ent. Blätt., 34 (4): 184.

Allied to *A. (B.) macrocera* Th. and *A. (B.) parvula* Man. (*cauta* Er.), but larger on an average, broader and more robust, especially as compared with the former: with this species it agrees in colour and in the exserted setae of the tibiae, with the second-named in general shape, and with both in shape and sculpture of hind body (the reticulation contrasting with that of *ischnocera* Th., *setigera* Shp., etc.), and in the general pubescence and body setae. From both it differs chiefly in structure of antennae, sculpture of front parts and sexual characters.

Black, scarcely shining; thorax, elytra and apex of hind body more or less obscurely lighter; legs yellow, with the femora and tibiae, except the anterior ones, infuscate. *Antennae* rather stout, distinctly thickened towards apex; penultimate joints plainly transverse, apical one oblong and rather short, not quite as long as the two preceding together. *Head* large and broad, with its greatest width at the eyes, which are large and prominent, together with the thorax strongly and roughly punctured; the average width of the interspaces, which are strongly reticulate, is on both equal to or a little greater than that of the punctures. *Thorax* almost a half broader than long, hardly more contracted in front than behind, widest at middle, with a trace of a central channel towards base. *Elytra* strongly punctured, a shade more thickly than thorax. Middle tibiae with the upper of the two exerted setae very small: in the hind pair the large seta is central, and there is a much smaller one below it (whereas in *A. parvula* the larger seta is well below the centre, the other is near the base, and they are not so different in size). Length 2—3 mm.

Male with the upper plate of the sixth apparent abdominal segment simply truncate at apex; under plate produced beyond it, and narrowed towards the apex, which is broadly truncate and strongly and thickly set with dark setae. (In *macrocera* and *parvula* the under plate is not prolonged beyond the upper and its apex is rounded in a semi-circle.)

Female with the upper plate narrowed towards its apex, which is broadly and shallowly emarginate; under plate not produced beyond the upper, its hind margin subtruncate, not at all excised, thickly set with fine short pale cilia. (In *macrocera* and *parvula* both plates are shallowly emarginate.)

Rothiemurchus Forest, Aviemore, Inverness-shire, one female in dung, 15.vii.1938; determined by Dr. Benick, who records the species from the coasts of the North Sea and the Baltic and from Upper Bavaria and the Tyrol, in dung, in some numbers.

*A. parvula* is blacker and more shining; the antennae are considerably thinner and scarcely thickened towards apex, the last joint conical or subconical, and more elongate, fully as long as the two preceding together; the head smaller in proportion to the thorax, the eyes less prominent and the temples more so; the front parts more finely punctured, with weaker reticulation; the legs dark, and the tibial setae different (see above).

*A. macrocera* has the antennae much thinner and relatively longer, not incrassate, the joints more cylindrical and none of them transverse, the last much more elongate; the head narrower with smaller eyes; the thorax less transverse (a third broader than long), and extremely densely punctured; the head and elytra also are more closely and finely punctured.

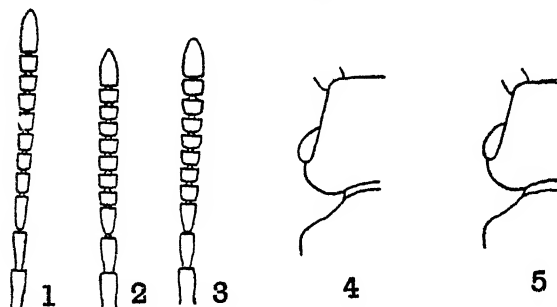
#### ***Atheta (Acrotona) benicki* sp. nov.**

Closely allied to *A. parva* Sahlb. (*pilosiventris* Th.) and *musicorum* Bris., from which, however, it differs considerably in the formation of the antennae, and to a less extent in other features. It

comes nearest on the whole to *parva*, with which it agrees in all respects except those shown in the following comparison:—

Antennae longer, basal half thinner, perceptibly thickened towards apex; joints 4 and 5 longer than broad, 6—10 about as long as broad, 11 more elongate (length to breadth about as 14 : 5) and less acuminate. Thorax without a trace of a central channel. Elytra scarcely longer than thorax, and narrower in proportion to it. Upper plate of sixth segment\* with well-marked lateral apical angles, broadly and rather abruptly truncate, hind margin very slightly rounded, but without trace of sinuation; apex of under plate visible beyond upper one from above ..... *A. benicki* sp.nov.

Antennae shorter, basal half stouter, not appreciably thickened from joint 5 onwards; 4—10 slightly transverse, 11 less elongate (about as 12 : 5) and more acuminate. Thorax always with a slightly marked central channel, at least at base. Elytra about a fourth longer than thorax, and broader in proportion to it. Upper plate of sixth segment\* without evident lateral apical angles, the margin here much rounded and in the middle weakly but distinctly sinuate; apex of under plate not visible beyond upper one from above ..... *A. parva* Sahlb.



FIGS. 1—3. Antennae; 1, *Atheta benicki* sp.nov.; 2, *A. parva* Sahlb.; 3, *A. muscorum* Bris.

FIGS. 4—5. Outline of side of head; 4, *Euplectus carolae* sp.nov.; 5, *E. nanus* Rchb.

The slender antennae with their strongly elongate fourth joint will very readily separate the new species from its allies. In this point it has a resemblance to *A. macrocera* Th., but in that species the antennae are, in proportion to the size of the insect, longer and more robustly formed but somewhat less thickened towards apex; the thorax is not more narrowed in front than behind and is more densely punctured; the colour is obscurer, the front parts duller; the exserted setae are much larger, are present at the sides of the thorax, and on the hind tibiae are differently placed; and the sexual characters are different. The only features in which *benicki* resembles *muscorum* rather than *parva* are the unfurrowed thorax and the shape of the upper plate of the sixth segment. (As *muscorum* is

\* I have not yet been able to examine enough specimens to determine for certain whether the hind-body characters given here for each species apply equally to both sexes.

sometimes considered a variety of *parva*, but is undoubtedly distinct, it may be as well to note the differences: it is on an average larger, proportionately more robust in front, the head is larger, the antennae stouter, somewhat longer, and plainly thickened to apex, the fourth joint quadrate, the last markedly thicker and less pointed; the thorax lacks any trace of a central channel; the legs are lighter; the tibiae, especially the hind pair, longer, and the seta of the hind tibiae is smaller and placed considerably nearer the middle; the characters of the sixth abdominal segment are almost as described above for *benicki*, but the hind margin of the upper plate is a little more rounded, especially in one sex which I take to be the male).

Type and paratype in my collection, taken at Shell Bay, Studland, Dorset, 13.viii.1937, under horse dung in company with *A. sordidula* Er., *germana* Shp., *testudinea* Er., etc. Had I distinguished the species at the time a series could probably have been obtained. An example sent to Dr. Benick was examined and returned as a new species, which I have pleasure in naming after him in grateful recognition of much valuable assistance.

#### PSELAPHIDAE.

##### *Euplectus carolae* sp. nov.

A relatively large and broad but not very elongate species, of the length of the largest specimens of *E. tomlini* Joy, but more convex and with wider thorax and elytra. It is, however, most closely allied to *E. nanus* Rchb., with which it agrees in general shape and sculpture, structure of antennae, basal fovea and frontal furrows of head, abdominal (including sexual) characters, and colour; it therefore need not be compared with any other species.

It differs from *nanus* in its much greater size (length 1.7—1.8 as compared with 1.3—1.4 mm.) and more robust build in all its parts, and notably in the relatively shorter eyes, which at their base stand out much more prominently from the temples, and in the fact that the foremost point of the eye is at the level of the centre of the head; whereas in *nanus* the angle between eye and temple is much flatter, and the foremost point of the eye is well in front of the level of the centre of the head. In *carolae* the longitudinal diameter of the eye is considerably less than the distance from eye to front angle of head, while in *nanus* it is just equal to this distance. This character of the eyes, which is more clearly brought out in a drawing, seems to preclude the possibility of the new species being a 'giant' form of *nanus*: nor is it merely sexual, for in *Euplectus*, at all events in *E. nanus*, the size and shape of the eyes and head do not differ in the sexes. Slighter and more comparative characters are, in *carolae*, the rather more transverse head and thorax and more ample elytra, the longer anterior margin of head and consequently greater separation of base of antennae, and the slightly stronger puncturation, especially perhaps on the thorax.

In Raffray's revision of the Palaearctic species of the genus there is none which will fit the present one, nor does any European species since described even approach it.

Type and paratype (both males) in my collection, taken in Windsor Forest, viii.1939, under thick oak bark, with *Dryocoetes villosus* F., *Silvanus unidentatus* F., etc.

63 Blackheath Park.

London, S.E.3.

January 30th, 1940.

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#### FURTHER OBSERVATIONS ON THE PSYLLIDAE (HEMIPT.) OF THE INNER AND OUTER HEBRIDES.

BY J. W. HESLOP HARRISON, D.SC., F.R.S., AND

G. HESLOP HARRISON, B.SC., PH.D.

As is well known, members of the Department of Botany, King's College, University of Durham, have been studying the flora and fauna of the western islands of Scotland for a considerable number of years. During the course of these investigations, considerable attention has been given to the insect life of the various islands we have visited. Amongst the insect groups subjected to more intensive study have been the Psyllids. As a result, one of us (G.H.H.), who was then responsible for the Psyllidae, produced a paper in 1938 (*Ent. Mon. Mag.*, 72: 48-51) dealing with their distribution in a dozen Hebridean Islands. Now that we have extended our explorations so considerably, and also for other obvious reasons, the present seems a fitting occasion for placing on record at least a portion of our more recently acquired knowledge in respect to the occurrence of the group in the Hebrides. It should be noted that Bernery (B) and Pabbay (B) refer to the islands of those names in the Barra Islands, and Pabbay (S) and Soay (S) to the islands lying off Skye.

*Livia juncorum* Latr.—Galling and producing heavy distortion on various species of *Juncus*, including *Juncus Gerardi* Loisel, which seems a new food plant. More or less isolated plants in bare damp places seem to be chosen in preference to denser *Juncus* colonies. Collected on Raasay, South Rona, Scalpay, Soay (S), Eigg, Rhum, Muck, Canna, South Uist, Barra, Vatersay, Sandray, Muldoanich, Pabbay (B), Mingulay and Berneray (B). In the Outer Hebrides the species rarely ascends very high, so that in Berneray and Mingulay it is to be found locally on the coasts, along stream sides and on the edges of deserted paths up to about 200 ft. above sea level; in the other Outer Isles it is a little more widely distributed.



*Aphalaroida ericae* Curt.—Generally distributed on the moorlands on all the Inner and Outer Isles on which its food plants, *Calluna vulgaris* Salisb. and *Erica cinerea* L., grow; both larvae and adults were beaten or swept. The insect was not detected on Berneray (B) in spite of careful search.

*Aphalara exilis* Web. & Mohr.—Only noted on Soay (S), where larvae were found on *Rumex Acetosella* L., at or near the ground level.

*A. nervosa* Först.—Attached to yarrow; Raasay may be added to the meagre list of islands upon which it occurs.

*A. picta* Zett.—Quite abundant on *Senecio aquaticus* Hill on the barer marshy areas lying along Loch Scresort, Rhum, and in the Kinloch Valley. The food plant, it should be emphasised, is that preferred in the Hebrides, and seems very different from those put forward in text-books.

*Psylla alni* L.—Far from uncommon on *Alnus rotundifolia* Mill. on Eigg, Rhum, and Pabbay (S), where its larvae, with their waxy secretions, often make beating a very unpleasant task. On Soay (S), where only one alder was discovered, the insect was present but rare. In view of the abundance of alder pollen in Soay peats, it must have been much more prevalent in earlier Post-Glacial times.

*P. försteri* Flor.—Just as abundant as, and occurring with, the preceding on Eigg, Rhum and Pabbay (S), but absent from Soay (S). Black and red autumnal forms were collected on Eigg in late autumn 1936.

*P. buxi* L.—Adults and the characteristic galls occurred on Buxus planted near Kinloch, Rhum.

*P. peregrina* Först.—Necessarily limited by the distribution of its food plant *Crataegus*; none the less, it was common enough both in its red and green guises on Rhum, Eigg and Canna. Found on Rhum near Kinloch, at Papadil in the extreme south, and on an isolated hawthorn growing near the manse at Shamhnan Insir, deserted a hundred years ago.

*P. sorbi* L.—Also common enough on Eigg, Muck, and Rhum on *Pyrus Aucuparia* Gaertn.; much rarer on Barra and South Uist, although beaten from mountain ash in various gorges on Ben Tangaval, along Allt Heiker, Allt Volagir, on Loch Iarras, etc.

*P. mali* Schmdbg.—Green summer forms on apple on Rhum.

*P. melanoneura* Först.—Somewhat common on a red-flowered hawthorn near the school house on Rhum, as well as on Eigg.

*P. bagnalli* Harr.—As usual, swept sparingly from various species of *Juncus*; only on Rhum and Canna.

*P. dudai* Sulc.—Rather common on sheltered and low-growing

*Salix aurita* L., and very rarely on *Salix atrocinerea* Brot., on Rhum, Eigg, Muck, Canna, Soay (S), Pabbay (S), South Uist, Eriskay, Barra, Vatersay, Muldoanich, Sandray and Pabbay (B). On Mingulay and Berneray (B) it was much rarer and favoured *Salix repens* L. in addition to *S. aurita*. The former is an unusual food plant which we have only noted previously as harbouring *P. dudai* colonies on Ross Links, Northumberland.

*P. ambigua* Först.—Also a sawfly-feeder; found on every island but, nevertheless, exceptionally scarce.

*P. brunneipennis* Edw.—Common enough in the Inner Hebrides, where the insect seems to be either bivoltine or to possess an irregular, long-drawn-out larval period. Likewise attached to Salices, although hibernating red and black forms were beaten from Coniferae on Poll nam Partan, Eigg, in September 1936.

*P. hartigii* Flor.—Rather common and variable, with the var. *boernerii* Haupt on Soay and Rhum; much rarer on Eigg and South Uist. In all cases *Betula alba* L. or *B. pubescens* Ehrh. played the part of food plant.

*Psyllopsis fraxini* L.—Galls only on *Fraxinus excelsior* L., Eigg and Pabbay (S), but adults were freely beaten from ash on Rhum in 1937 and 1938.

*P. fraxinicola* Först.—With the preceding, but adults captured on all three islands in small numbers.

*Trioxa urticae* L.—In enormous numbers, wherever *Urtica dioica* L. and *U. urens* L. grow, on both Inner and Outer Islands. As the species is bivoltine (or even trivoltine!) in all the islands, it is extraordinary how the insect survives where the nettles are reduced to shreds by larvae of the moth *Simaethis fabriciana* L. as on Sandray and Pabbay (B).

*T. salicivora* Reut.—A few green larvae, with their pit galls, were found on *Salix aurita* in the dense thickets of that species which are to be encountered near to the Post Office, Eigg. This species has not been recorded by us previously from any Hebridean island.

*T. munda* Först.—Larvae from *Scabiosa succisa* L. on Pabbay (S), Canna, Rhum, Coll, Berneray (B) and Mingulay.

*T. remota* Först.—Larvae in pit galls on oak on Soay (S); necessarily rare as only three oaks were discovered on that island. Adults were beaten much more freely from their 'shelter plants,' *Pinus* and *Picea*, on Eigg.

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January 29th, 1940.

FURTHER SAWFLIES OF THE GENUS *PONTANIA* COSTA (HYM.,  
SYMPHYTA) IN BRITAIN.

BY ROBERT B. BENSON, M.A.

Two of the species dealt with in this paper, *Pontania nigrolineata* (Cameron) and *P. bridgmanii* (Cameron), were originally segregated and described from British material, but, as with so many valid species described by Cameron, Konow never recognised them and all recent workers have followed Konow. Students of plant galls in this country have, however, continued to recognise *P. bridgmanii* (Cameron) as distinct from *P. proxima* (Lep.) because of the form of its galls, not because of any differences in the adults. The differences in the adult morphology of both the above species have only recently been discovered. The third species dealt with in this paper is entirely new. This brings the total number of British species of *Pontania* now recognised for certain up to twenty-one (six leaf-edge rollers and fifteen gall-makers) compared with Morice's nine (four and five) (1906).

*Pontania nigrolineata* (Cameron).

In addition to *Pontania purpureae* (Cameron) (Benson, 1938, p. 256) we apparently have still another leaf-rolling *Pontania* in Britain related to *P. leucapsis* (Tischbein). This further species was actually described by Cameron (1879, p. 108) as *Nematus nigrolineatus*, but Konow and later writers have all regarded this name as synonymous with *P. leucapsis* (Tischbein).

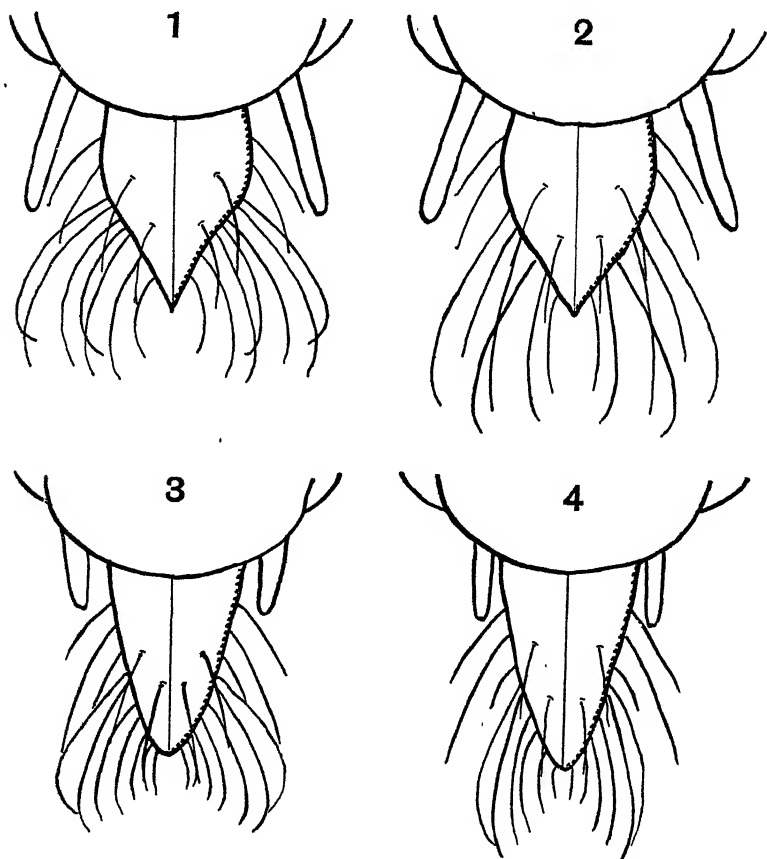
The two species can be separated thus:—

*P. leucapsis* (Tischbein).—♀ has the sawsheath in profile short and almost hooked apically, though the actual shape is extremely variable; viewed dorsally the hairs on the sheath are more strongly curved and are directed more outwards (Fig. 1). The stigma of the forewing is usually yellowish-white, with at most the apical margin infusate, and the costa is entirely white [in some specimens from Scotland the stigma and costa are much darker and approach *P. nigrolineata* (Cam.) in colour]; the head usually with large yellow temporal spots; the pronotum broadly white-margined behind; the hind femur and tarsus are not entirely black. ♂ coloured as ♀ except that the stigma is generally infusate; the genital plate is testaceous and semi-transparent. Larva lives in rolled leaf-edges of various willows such as *Salix atrocinerea* Brot.

*P. nigrolineata* (Cameron).—♀ has the sawsheath mucronate apically; viewed dorsally the hairs on the sheath are less strongly curved and are directed more backwards (Fig. 2). The stigma is fuscous on its apical third to half and the costa is infusate apically; the temples, pronotum, and hind femur are mostly black. ♂ coloured as in ♀, but the stigma is generally infusate; the genital plate is black and opaque. Larva (Cameron, 1882, pl. vii, fig. 11) in rolled leaf-edges of *Salix viminalis* L.

The leaf-roll made by *P. nigrolineata* is shown in Cameron, 1885,

pl. xi, fig. 7, but the host-plant is wrongly recorded as *S. vitellina* (p. 194). Cameron records the species from Clydesdale, Worcester and Gloucester. In the British Museum there are specimens of *P. nigrolineata* (Cameron) from SCOTLAND, Perthshire, Rannoch (R.B.B.); Moray, Grantown (R.B.B.); and ENGLAND, Cheshire, Lymn (H. W. Miles). From SWEDEN there is a series from Skåne: Höör, Dagstorp sjö, Elsöv and Skäralid, collected by D.M.S. and J. F. Perkins, v-vii. 1938.



FIGS. 1—4. Sawsheath from above: 1, *Pontania leucapsis* Tischbein; 2, *P. nigrolineata* Cameron; 3, *P. proxima* Lep.; 4, *P. bridgmanii* Cameron.

*Pontania bridgmanii* (Cameron).

Dr. Mary Carleton has shown (1939) in her studies on the sawfly *Pontania proxima* (Lep.) (the common Bean-Gall Sawfly) that there are distinct biological races on *Salix fragilis* L. and *S. triandra* L.

When adults of one of the races were given the food-plant of the other, eggs were laid only with extreme reluctance. 'The galls did not develop normally, the larvae generally died, and the small proportion of adults which eventually emerged were undersized weaklings, all of which died without laying eggs' (p. 621). Dr. Carleton supplied the British Museum with a long series of adults bred from both of these host-plants, but no morphological difference could be found between them. The galls of the two races are, however, very distinct:—

(a) On *S. triandra* the gall is dark red above, pale yellowish-green below and the cuticle is glabrous and quite smooth.

(b) On *S. fragilis* the gall is bright rose-pink above and either pink or yellowish-green below and the cuticle is raised into many uneven little ridges and protuberances.

I also have a specimen, and Mr. M. Niblett has kindly lent me others, bred from galls on *Salix alba* L.; these also are apparently indistinguishable from Dr. Carleton's material. In comparing Dr. Carleton's material with specimens bred from *Salix caprea* L. and *atrocinerea* Brot. (partly my own and partly lent by Mr. M. Niblett) constant, but slight, differences were found in the arrangement of hairs on the sawsheath and slight though variable differences in the proportion between the length of the sawsheath and basal hind tarsal segments. Thus it appears that in addition to the biological races occurring on the different species of willows, we have the group of races on the *fragilis-alba-triandra* willows distinct morphologically in the adults from the group of races on the *caprea-atrocinerea* willows. These two groups of races then constitute different species. Unfortunately, unless specimens are in good condition it is difficult to separate them without biological data. Not being able to see Lepeletier's types at present, I arbitrarily select the race of *S. fragilis* L. as the type race of *Nematus proximus* Lep. For the group of races on *S. caprea* L., etc., the name *Nematus bridgmanii* Cameron (1883, p. 193) is available.

The two species can be separated thus:—

(1) *Pontania proxima* (Lep.).—Sawsheath viewed dorsally with hairs near apex projecting more outwards (Fig. 3); length of sawsheath (viewed laterally and measured straight from the apex to the notch in the lower margin where it adjoins the oblong plate) longer than the two basal hind tarsal segments together (measured along the upper or outer margin from the apex of the tibia) (Fig. 5); basal hind tarsal segment shorter than segments 2+3+4. Galls on *Salix fragilis* L., and also *S. triandra* L., *alba* L. (?), etc. Widely distributed throughout Britain.

(2) *Pontania bridgmanii* (Cameron).—Sawsheath with hairs near apex projecting more backwards (Fig. 4); sawsheath not longer than the two basal hind

tarsal segments together (Fig. 6); basal hind tarsal segment longer than segments 2+3+4. Galls on *Salix caprea* L., *atrocinerea* Brot. and ? *aurita* L., etc. (Cameron, 1885, pl. ix, figs. 1 (gall), 1a (? larva). Widely distributed throughout Britain.

In addition to the type material of *P. bridgmanii* from Brundall, near Norwich, bred from galls on *Salix caprea* L. by J. B. Bridgman, I have myself bred specimens also from galls on *S. caprea* L. in Bedfordshire and Buckinghamshire, and Mr. Niblett has supplied me with material bred from galls on *S. caprea* L. and *S. atrocinerea* Brot. from various localities in Surrey. Galls on *S. caprea* L. are oval and smooth, dark shining green, glabrous above and hairy beneath; galls on *S. atrocinerea* Brot. are smaller and more hairy.

The only specimen named '*bridgmani*' in the Cameron collection in the British Museum belongs to the species *Micronematus monogyniae* Hartig and cannot, therefore, be considered as the type, as it differs fundamentally from the original description of the species in such important characters as the claws, the shape of the clypeus and the form of sawsheath. From the Bridgman collection at the Castle Museum, Norwich, Miss Barnard, the Curator, kindly sent me for examination all the specimens named as belonging to that species. These consisted of three female *M. monogyniae* Hartig, determined as '*Nematus bridgmani*' by Cameron, and four female *Pontania bridgmanii* Cameron, named '? *bridgmani*' by Bridgman. I do not hesitate to say that the first series had simply been wrongly labelled by Cameron, as his description obviously refers to the second series, one of which actually bears a label 'bred 5.80. B.' (= Brundall). This last specimen I therefore make into a lectotype.

Cameron also described the male, none of which sex occurs in Bridgman's collection now, nor in recent bred material, so that I have been unable to confirm the existence of males in this species. *P. proxima* Lep., as Dr. Carleton has shown, normally reproduces parthenogenetically; in all the many hundred specimens she reared, only a single male occurred.

### ***Pontania harrisoni* \* sp. nov.**

♀. Black with the following parts yellow: *head* (except the palps and apices of mandibles, which are more or less piceous, and a large piceous spot covering the occipital and post-occipital area

\* This species is named after Professor J. W. Heslop Harrison, F.R.S., who tells me in a letter dated 10 ii. 1940 that he has been already well aware of the existence of the galls of this species and that he had actually recorded the galls as being untypical for *Pontania salicis* Christ (= *viminalis* L.) in 1927, *Vasculum*, 13: 158, where he wrote of this species as 'galling examples of the hybrid willow *Salix purpurea* × *S. viminalis*, on the Wear at Durham, the galls being so far untypical as to warrant further study.'

often spreading to the antennae, and inner and outer orbits), apex of *antenna*, especially beneath, more or less the *pronotum*, sometimes a spot on the mesopleura, tegula, and sometimes scutellum, *legs* (except bases of coxae and more or less apices of tarsal segments, which are piceous, and bases of tibiae, which are yellowish-white) more or less the whole underside of the *abdomen* and several apical tergites. *Wings* hyaline; stigma with apical two-thirds piceous; base of stigma, costa, subcosta and anal vein brownish-white; rest of venation piceous; length, 5.5-5 mm.

*Punctuation*: the head, pronotum, more or less the mesonotum and upper side of abdomen with very fine surface coriaceous sculpture. *Head* with exposed part of labrum about three-quarters as long as broad; clypeus usually with the front margin deeply excised to more than half its total length; frontal region raised above orbits and separated from them by a suture; frontal basin concave and with a channel communicating in front with the median fovea (as in *P. viminalis* L.), but the median fovea is deeply impressed; antenna shorter than a hind tibia with its tarsus (1:1.1); POL approximately equal to OOL. *Thorax* with hind tarsus shorter than tibia (1:1.1) (Fig. 8), and hind femur not so broad as tarsal segments 3+4. *Abdomen* with sawsheath + oblong plate shorter than a hind femur (1:1.15) and the sawsheath bluntly rounded apically in profile; sawsheath in dorsal view and genitalia not distinguished from *P. viminalis* L.

♂. As in ♀ except for the sexual characters and its much darker colouring, the head capsule, except round the mouth, being usually almost entirely black, so also is the pronotum and most of the abdomen except for the genital plate and apical tergites; antenna approximately equal to a hind tibia with its tarsus; hind tarsus approximately equal in length to a hind tibia.

*Length* 4—5 mm.

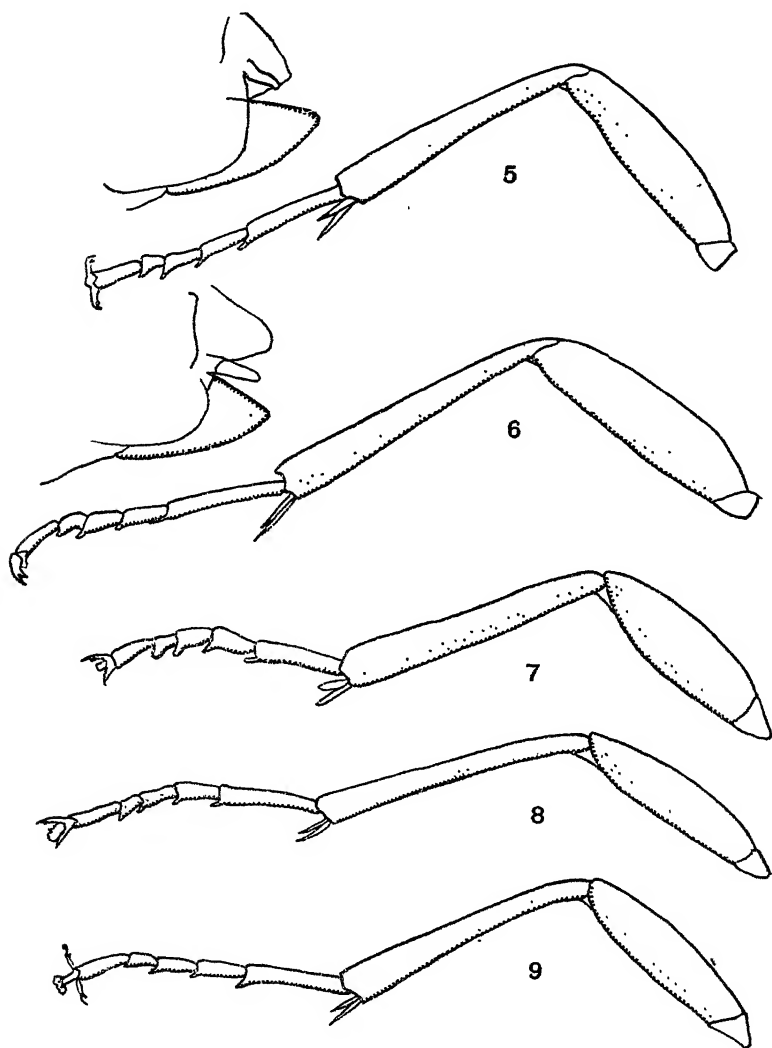
SCOTLAND, Roxburghshire, Newcastleton, 15 ♀♀, 11 ♂♂, and ENGLAND, N. Yorkshire, Middleton-in-Teesdale, 1 ♀, bred iv.v. 1938 from galls on *Salix purpurea* L. and its hybrids collected in viii.1937 (R.B.B.). BOHEMIA, Chodau, 75 ♀♀, Richard v. Stein collection (B.M. 1935-271).

Gall rather similar to the gall of *P. phyllicifoliae* Forsius, but larger, though variable in size; in shape it is immensely variable, being either spherical, oval, pyriform, bicuspid or tricuspid, and always attached to the mid-rib on the underside of the leaf.

When I was staying in Roxburghshire in August, 1937, I found this unknown gall in countless thousands on the banks of the Liddel (Dumfries and Roxburghshire), the North Tyne (Northumberland) and the Tees about Middleton and Darlington (Durham and Yorkshire). Many hundreds were brought home and the sawflies emerged in the spring following.

The species is related to *P. viminalis* L., but differs from this and also *P. phyllicifoliae* Forsius in having the hind tarsus in the

female shorter than the tibia. Thus it would appear to be most closely related to *P. collactanea* Först. (on *S. repens* L.), which has the hind tarsus even shorter than the hind tibia (1: 1.4) and the leg segments stouter; the breadth of the hind femur in *P. collactanea*



FIGS. 5—6. Sawsheath in profile compared to length of basal hind tarsal segments: 5, *Pontania proxima* Lep.; 6, *P. bridgmanii* Cameron.

FIGS. 7—9. Hind leg to show comparison between length of tarsus and tibia and differences in thickness of segments, etc.: 7, *Pontania collactanea* Först.; 8, *P. harrisoni* sp. nov.; 9, *P. viminalis* L.



Först., for instance, is greater than the hind tarsal segments 3+4 (Fig. 7). It is also very similar to the new species in colour, save that it has an entirely pale stigma in the forewing.

In many collections the new species is probably mixed with pale forms of *P. viminalis* L.; this was so in the Stein collection in the British Museum.

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#### Review.

'A SUPPLEMENT TO THE BUTTERFLIES AND MOTHS OF NEW ZEALAND.' By G. V. HUDSON. 4to, pp. vii+95 (387-481), 10 coloured plates (53-62). Published by Ferguson and Osborn Ltd., Wellington, New Zealand. Price £2 2s. od.

It is a great pleasure to see this splendid supplement to a fine work so beautifully produced. The first edition, a thin quarto with thirteen coloured plates, chromo-lithographed, was entitled 'New Zealand Moths and Butterflies (Macrolepidoptera).' Appearing in 1898, it was the first attempt to provide a comprehensive survey of at least the larger forms of New Zealand Lepidoptera: it gave an account of 238 species. Thirty years later it blossomed into a magnificent volume of xi+386 pages and 10+52 plates, the latter printed by the four-colour process. Now we have to consider a supplement which gives further notes on species previously discussed, and adds some 207 species to the previous volume, nine of which are here described for the first time. The author, in the introduction, says 'It is to be regarded in every respect as a supplement to the "Butterflies and Moths of New Zealand," and is intended to be used solely in conjunction with that book. For this reason both the pages and the plates in the supplement are numbered in continuation of those in the earlier work, but a separate index has been prepared for the supplement alone.'

Mr. Hudson admits that no attempt has been made to consider the genitalia, and gives reasons for the omission. It is, at any rate, a refreshing change from the attitude of extremists on the other side who almost appear to consider a species as a genital apparatus unfortunately attached to a body furnished with

deplorably variable appendages. We cannot, however, refrain from asking Mr. Hudson whether consideration of such a fundamental part of the insect as genital apparatus may not give at least as good guidance in separating species as measurements of the length of pectinations of the male antennae by which he separates 'with certainty' three species of *Melanchra* which, he says, appear to be connected by intermediate forms. If only we could all remember that a whole is the sum of the parts, and that a species is made up of numerous morphological and physiological characters. Some vary in one way, some in another, and difference in genitalia is by no means on a par, in every species, with differences of other parts of the body.

In the supplement notes on butterflies occupy the first four pages. We see that further occurrences of *Danaus plexippus* L. are reported, and that it has been bred and liberated on a large scale, but that no more specimens of *D. chrysippus* L. have been recorded. Mr. Hudson gives almost half a page to discussing the famous 'Hampstead Eye' figured as a British species by Petiver (1717), and is of the opinion, with which we think few will agree, that it was actually *Precis villida* F. which reached Great Britain as a migrant. Our old friend the Painted Lady seems possibly to hibernate in New Zealand, although not in England. The space of two pages is devoted to *Pieris rapae* L., with an account of its spread after its introduction in 1930. The author thinks there may be four broods during an average summer. Reading that 'an example of *Pieris rapae* was actually observed flying . . . on June 24, 1938,' one has to remind oneself that of course this is matter for comment, being the equivalent of seeing one at Christmas time in England. We find the figures of this butterfly some of the least satisfactory of the many very beautiful illustrations.

Coming to the moths, we find no additions to the Sphingidae or Arctiidae (*sic*, Mr. Hudson does not follow Article 4 of the international rules of zoological nomenclature in his spelling of this family name). The following additions are made to the several families here noted: Noctuidae, 20; Geometridae, 18 (including 3 new species); Pyralidae, 30; Pterophoridae, 1 (a new species); Tortricidae, 20; Tineidae, 113 (including 5 new species); Hepialidae, 1; Micropterygidae, 4.

	New Zealand.		Great Britain.
Butterflies .....	16	...	68
Sphingidae .....	2	...	17
Arctiidae .....	6	...	31
Noctuidae .....	157	...	334
Geometridae .....	260	...	280
Pyralidae ( <i>sens. lat.</i> ) .....	245	...	189*
Thyrididae .....	1	..	—
Pterophoridae .....	16	...	34*
Psychidae .....	2	...	0
Cossidae .....	2	...	3
Tortricidae ( <i>sens. lat.</i> ) ....	138	...	338*
Aegeriidae .....	1	...	15*
Tineidae ( <i>sens. lat.</i> ) .....	578	...	687*
Hepialidae .....	21	...	5*
Micropterygidae .....	26	...	11*
Total . . . . .	1471	...	2021

A census of species is given, and is here compared with a census for Great Britain, for which, except in the case of groups marked with an asterisk (\*), the reviewer is indebted to the labours of Mr. R. F. Bretherton. The starred figures are taken from 'A list of the Micro-Lepidoptera of the Oxford district,' by the late E. G. R. Waters (1929, *Proc. Ashmol. nat. Hist. Soc.*, 1928: 71).

This list brings out interesting differences between the faunas of New Zealand and Great Britain. The family Thyrididae is the only one represented in the former area but not in the latter. On the other hand, the following families appear to be unrepresented in New Zealand while occurring, in the numbers now given, in the home country: Notodontidae, 25; Thyatiridae, 9; Lymantriidae, 10; Lasiocampidae, 11; Endromiidae, 1; Saturniidae, 1; Drepanidae, 6; Nolidae, 5; Chloephoridae (including Sarrothripinae), 4; Brepidae, 2; Zygaenidae, 10; Cochlididae, 2; Cossidae, 3. These numbers, added to the former British list, make a total of 2,110 for Great Britain, compared with 1,471 for New Zealand, Tineidae in both cases heading the roll. There are some interesting differences in the proportionate values of other families: e.g. in New Zealand Noctuidae form nearly 11 per cent. of the whole, in Great Britain nearly 16 per cent.; Tortricidae in Great Britain form just over 16 per cent. of the whole, in New Zealand just over 9 per cent.

An appendix of some three pages deals with (1) the Lepidoptera of a particularly interesting area, the Te Anau-Manapouri Lake District. (2) An unknown case-bearing larva, of which a figure is given. Although Mr. Hudson has endeavoured every year from 1910 to rear this, he has been unsuccessful. (3) A suggested explanation of variation in cryptic Lepidoptera, first put forward in 1935 in this Magazine (71: 156-8). The author was unaware that E. B. Poulton had long previously written the same explanation. (4) Additional notes on seven species.

The index, for this supplement only, has been tested at random and found to be accurate. There remain for consideration the ten plates, of which two are concerned with larvae and pupae. We have nothing but praise for the figures themselves, but find the arrangement a little tiresome. Some of the larvae face one way, some another, and the method of numbering the figures causes difficulty, whether one looks in the explanation for the name of a particularly attractive figure, or looks first at a name and its reference number and searches for a figure with that number. The result of the arrangement of the figures is that allied larvae are not near each other, and the reference numbers not in sequence. The same applies to some of the plates of moths: nearly allied species on Plate LXI, for instance, are, in the case of Pyralidae and Micropterygidae, nearly as far apart as possible. The figures themselves, enlarged for the smaller species, are exquisitely done by Messrs. Vaus and Crampton, who have surpassed those they did for the main volume. The figure of the male *Kiwaia ieanae* Philp. (Pl. LVIII, fig. 9) admirably supports the author's account of it as a 'most remarkable little insect': it is surely the oddest looking moth that was ever figured, with its dense fuzzy hairs on the hind wings obscuring the body. The treatment, in general, of the fine hairs of the fringes is an advance even upon Messrs. Vaus and Crampton's previous work.

Finally, we would emphasise the lack of so comprehensive, well illustrated and up-to-date a work on *British* Lepidoptera, and hope that this reproach will not be applicable much longer to British Entomology. The mother country has certainly been taught a lesson by her daughter.—G. D. H. CARPENTER.

## NOTES ON BRITISH COLLEMBOLA.

BY RICHARD S. BAGNALL, D.SC.

This is the sixth part of the series and is continued from *Ent. Mon. Mag.*, LXXV, pp. 188-200 (1939). The following species are brought forward as additions to the known British fauna:—*Anurophorus unguiculus* sp.n., *Folsomia sexoculata* (Tlb.) Axelson, *Isotomurus plumosus* sp.n., *I. antennalis* sp.n., *Tomocerus minutus* Tlb., and *Orchesella bifasciata* Tlb., whilst *Folsomia thalassophila* sp.n. replaces the *F. sexoculata* of Carpenter and Evans nec Axelson.

*Anurida tullbergi* Schött is presumed on good grounds to be a synonym of *A. crassicornis* L. & O. M. Reuter, originally described from the Tay near Perth. Further interesting records are given of this and other halophiles, whilst a beginning is made in an attempt to make known the Collembola of our hill districts and mountains.

*Anurida crassicornis* L. & O. M. Reuter.

1879, Scot. Nat., p. 208; *Anurida tullbergi* Schött, 1892, Ent. Tidskr., p. 192; 1893, K. Svenska Vet.-Akad. Handl., XXV, p. 91, Pl. VII, figs. 17-18; Bagnall, 1909, Trans. N.H. Soc. Northd. D'ham & Newcastle-on-Tyne, N.S., III, p. 499 (p. 6, Sep.); 1939, Ent. Mon. Mag., LXXV, p. 93.

When, earlier this year, I recorded *A. tullbergi* from the Thames and stated that it would almost certainly be found to be the same species as described by the Reuters from the Tay, near Perth, I had quite forgotten that I had prepared a note on this subject some years ago. The data are embodied herein. In my 1909 paper I recorded the species from three localities on the Derwent (DURHAM) and from the Tyne at Wylam (NORTHUMBERLAND), and this year have recorded it from the Thames, where I have since (vii.39) found it plentifully on both sides of the river at Putney, Barnes and Chiswick past Kew Bridge to near Richmond. But, according to the unpublished note referred to above, in 1910 and 1911 I found the species in numbers on the Wear near Penshaw and at Chester-le-Street (DURHAM), x.10 onwards, and more sparingly on both the Durham and Yorkshire banks of the Tees near Piercebridge (25.vi.10) and also above High Force (23.vi.10) and at Barnard Castle in 1911 (DURHAM). In May, 1924, I found a few examples on the River Forth not far from Stirling, and I therefore consider that we must accept the synonymy expressed above. I should add that in 1912 I had two specimens sent me from a Kew hothouse, and in view of the habitat I sent them to Axelson for his opinion, who, in

referring them to *A. tullbergi*, informed me that he had taken the species in Finnish hothouses — probably introduced with river shingle.

***Anurophorus unguiculus* sp.n.**

Length 0.75 mm.; colour dark; body vestiture fine, somewhat sparse. Organ of Ant. III with two very short, slightly curved and somewhat stout sense-rods protected by a long rod at each side as described for *Anurophorus racovitzae* Den. and *Pseudanurophorus boernerii* Stach. *Unguiculus* or *empodial appendage* of foot well formed, lanceolate and approximately one-half the length of the claw; *libiotarsus* without tenent hairs, much as figured for *Pseudanurophorus boernerii* Stach.

I hope to secure further material before making a closer study of the species, which is sharply separated from *A. laricis* by its small size, the presence of an additional pair of outer sensory cones in Ant. III, the absence of tenent hairs and the presence of a well-formed empodial appendage.

Evans (Carpenter and Evans, 1899) records finding two small examples of *A. laricis* Nic. from wet sphagnum, Bavelaw Moss, which might conceivably be referable to this species.

CHESHIRE, Lindow Common, Wilmslow, two examples in wet sphagnum, 19.vii.39.

***Isotomodes templetoni* Bagn.**

EIRE: CORK, Glen-Gariff, from under stone on mountain, 19.ix.39 (*Litster*). Now recorded from Counties ANTRIM, DOWN and CORK, but not yet found outside Ireland.

***Folsomia thalassophila* sp.n.**

*Isotoma sexoculata* Carpenter & Evans, 1904, Proc. R. Phys. Soc. Edin., XV, p. 216, Pl. IV, figs. 1-4, *nec* European authors.

When bringing this species forward as British, Carpenter and Evans pointed out that the Scottish specimens were paler in colour than typical Continental examples of the species. However, they erroneously suggested that the marine station in which Evans found it was remarkable. Tullberg, in briefly describing the species, records it from under thrown-up seaweed from the Gottland coast ('uppkastad tång på östra kusten af Gottland'); Schäffer (also cited) records the species from Elbinsel Kuhwärder, Hamburg, where Koltze, who collected the specimens, also found an example of *Anurida tullbergi*, and Lie-Pettersen (Norges Collembola) — also cited — found the species near Bergen from 'under stene i stranden ved Nordaasvandet (saltvand staar i forbindelse med havet).' Axelsson describes the species closely, and it would appear that this larger, strongly pigmented one, found in East Greenland, Jan Mayen Island, Spitzbergen, Norway, Sweden, Finland, N. Germany

and Switzerland, should be regarded as *sexoculata*. Both Axelson and Folsom record it as essentially a littoral form, but other authors have recorded it from the margins of lakes and streams.

A larger pigmented species has now been found on the Thames, and I have little hesitation in describing the Forth species as new, the chief difference lying in its small size, lack of pigmentation, important details of chaetotaxy in the body vestiture and in the broader obovate form of Ant. IV. Other details become evident on comparing the brief characterisations of the two species now published.

Length c.1.45 (1.2–1.6) mm., body pale, without pigment except for eye spots and sometimes, at most, minute isolated patches scattered in the head and fore-part of body. General clothing of short, fine setae somewhat closely set as in *sexoculata*, except that posteriorly, in Abd. IV–VI, they become progressively longer and coarser, and the outstanding sensory bristles are 3.0 times as long as the mucro. Abd. I–III each with postero-marginal fringe of a double series of closely set setae.

Relative lengths (and breadths) of Ant. II–IV, 18 (11), 16 (10) and 33 (12.5) respectively, IV obovate and only c.2.6 times as long as broad. Dentes noticeably longer than manubrium (1.3 to 1.35 : 1.0) and 6.0 times the length of the mucro. Ventral setae of manubrium weak, three on each side, viz. two distally arranged diagonally and a weaker one at some distance above, the most distal as long as or slightly longer (1.15) than mucro.

SCOTLAND: LINLITHGOW, coast near Dalmeny about one mile east of S. Queensferry, in numbers, 23.iii.01 (Evans), where I have found it commonly on a stretch of four to five miles from S. Queensferry to the mouth of the Almond at Cramond, viii.34 onwards. EDINBURGH, Cramond, i.37, and between Cramond and Granton, viii.34 onwards; FIFE, Culross and Torrieburn, 10.v.37; ARGYLL and DUMBARTON, near Arrochar, at the head of L. Long, 28.vii.35. Litster has sent me the species from several counties of N. Ireland and Eire. It is found considerably below high-water mark.

*Folsomia sexoculata* (Tlb.) Axels.

Numerous examples collected on the Thames below high-water mark in association with *Anurida crassicornis (tullbergi)* agree closely with Axelson's description of *Folsomia sexoculata*. Both Axelson and Handschin figure the entire animal in each case, showing the uniformity of the setae of the general vestiture of the body. Axelson, however, describes the manubrium as having only two stout ventral setae, one on each side, and in this the Thames examples do not agree.

Size 1.8 to 2.15 mm., stout. Colour grey to dark greyish or bluish-black; head and fore-part of body with pale mottlings and body with paler inter-segmental areas; lower parts and appendages lighter. General clothing of short

fine setae, uniform throughout; postero-marginal series of tergites Abd. I—III normal; the posterior outstanding sensory setae 2.4 times the length of mucro.

Relative lengths (and breadths) of Ant. II—IV, 29 (14), 26 (14) and 52 (13) respectively, IV unusually elongated and 4.0 times as long as broad. Dentes scarcely longer than manubrium (1.05 to 1.1 : 1.0); manubrial ventral bristles long and stronger than in *thalassophila*, of similar disposition but very variable in numbers, the distal series comprising 1 to 3 and those more widely separated above 1, 1+1 or 1+1+1 on each side, the most distal 1.4 to 1.5 times as long as the mucro. Dentes five times as long as the mucro.

LONDON, banks of Thames at low-water, near Kew Bridge, v.36 and 23.vii.39; near Richmond, 23.vii.39; Barnes and Chiswick, 30.vii.39. First British records.

*Agrenia bidenticulata* (Tlb.).

Shortly after recording this species from the North Tyne and from several Scottish localities (1909), I kept a look-out for it in suitable habitats and found that it was widely distributed in Scotland and the North of England. It is to be found amongst shingle and under half-submerged stones and pebbles in our hill-streams. In SCOTLAND I have found it in Inverness-shire, Aberdeenshire, Kincardineshire, Perthshire, Stirlingshire, Argyllshire, Bute, Ayrshire, Lanarkshire, Peebles-shire, Dumfries-shire and Roxburgh. In NORTHUMBERLAND, around Wooler and Cheviot, North Tyne, Tyne and Allendale; CUMBERLAND, near Alston (vi.27), Keswick district (vi.16) and Patterdale in streams, on Place Fell, the Pikes and Angle Tarn (v-vi.15); WESTMORLAND, near Appleby; Kirby Stephen (x.16) and Shap Fell (viii.20); LANCASHIRE, from a hillside stream near Darwen and above Grange-over-Sands, Furness; and YORKSHIRE, Wensleydale.

In some pages from my diary for 1910 I find that it was very frequently met with in S. DURHAM, namely from streams on Chapel Fell, 24.vi.10; around St. John's Chapel, 20-24.vi.10; Harthope Burn at 1,200 feet and Harthope Fell at over 2,000 feet, 22.vi.10; High Force and Langden Beck, 23.vi.10, and from near Piercebridge, 25.vi.10, where it occurred on both the Durham and Yorkshire banks of the Tees. In later years I took it on Mickel Fell, near Barnard Castle, Kilhope Law (vi.14), Sharnberry Ghyll near Egglestone-in-Teesdale (viii.14), Stanhope, Wolsingham and Edmundbyers.

The species is very active in both running and jumping, and in life has a distinct purplish sheen.

*Isotoma vestita* Brown.

This small glistening white species is essentially a hill species and is to be found in ground moss, sometimes in some numbers.

NORTHUMBERLAND, Blanchland Moors, in ground moss growing amongst heath, plentiful, 2.vii.39; Rothbury Moors, viii.39. DURHAM, moors round Roughside and Edmondbyers, viii.39. SCOTLAND: LINLITHGOW, Dalmeny Estate, in moss near edge of shore not far from the mouth of the Almond, ii.35. N. IRELAND: ANTRIM, White Rocks, Portrush, 18.vi.39, and Giant's Causeway, 25.vi.39, in moss (*J. Litster*).

### *Isotomurus antennalis* sp.n.

Length 1.5—2.0 mm. *Colour dark bluish-black*; body darkest dorsally; antennae entirely dark; eye patches black; claws, dentes and mucro pale. Foot as in *palustris*; emp. app. without tooth. Ant. c.1.5 times as long as the head; relative lengths (and breadths) of II—IV, 38 (16), 38 (17) and 55 (15) respectively; II and III broadening to distal fourth, subequal, and IV noticeably longer, c.1.5 times the length of III. Body setae fine, simple. Dentes 2.2 to 2.6 times the length of the manubrium; mucro of *palustris* type.

NORTHUMBERLAND, Blanchland Moor, in moss and amongst rush débris lying in half dried pot-holes, 4.v.39 (type and paratypes), and from the DURHAM moors lying on the other side of the Derwent at Roughside and between Blanchland and Stanhope, vi.39.

### *Isotomurus plumosus* sp.n.

Length c.1.2 to 1.5 mm. General body colour yellowish; body dorsally with a deep purplish-black median line, more or less broad, from and including th.ii together with a lateral marginal line which is narrower and usually less strongly pigmented, the three lines meeting at the tip of the abdomen; eye patches dark; a dark dorsal median spot or patch with, in some specimens, a short transverse marginal line immediately behind; anteriorly a dark patch or series of short connected post-antennal patches connecting the eye patches; antennae violet and legs pale with a violet tinge. Foot as in *palustris*, but the emp. app. larger in relation to the claw length. Lengths of Ant. II—IV relatively 35—41: 38—45: 47—54, III and IV being roughly 3.0 and 4.0 times as long as broad respectively.

Abd. IV—VI with some long ciliated bristles, those on IV nearly one-half the length of the dentes and very slender; general clothing of numerous small sparsely ciliate setae interspersed with some longer and stouter ones, especially near or along the posterior margins. The cilia of these setae are minute and sparse and not easy to ascertain except under a high power. Dentes approximately 2.25 times the length of the manubrium; mucro of *palustris* type.

INNER HEBRIDES (V.C. 104), Hysker Island, amongst earth at the roots of a plant submitted to Dr. Blackburn, iii.39, one dead specimen. NORTHUMBERLAND, Rothbury, in Sphagnum (dry), one only, viii.39, and CHESHIRE, Lindow Common, Wilmslow, in numbers in wet Sphagnum from a peat bog, 17-19.vii.39 (type and paratypes).

### *Tomocerus minutus* Tlb.

1930, Bagnall MS. in Womersley, Proc. R. Irish Acad., XXXIX, B, No. 11, p. 182.



I had long known this species as a not uncommon little insect of the Scottish Highlands, and it was only in 1925 that I realised it was not recorded as British!

In its simple dental spine it comes near *T. vulgaris*, from which it is distinguished by its small size, the few (2-3) inner teeth of the upper claw, the dental formulae and the short antenna, of which Ant. III is only about twice the length of IV.

SCOTLAND, Speyside, Deeside and Perthshire—old records—and probably widely distributed. According to Handschin it is known from Northern Europe, Bohemia and Switzerland.

*Orchesella bifasciata* Nic.

The remarks under the last species apply equally well to this; also the citation (p. 189) and the note on distribution.

The species is only 2.0 mm. in length, usually pale but for the darkly pigmented eye-patches, two blackish transverse bars occupying the anterior half or more of Abd. II and III and a lightly flecked design on Abd. IV.

*Orchesella alticola* Uz. var. *obscura* Handsch.

This mountain species was also included in my MS. list, but I was not then aware that Carpenter's *Entomobrya anomala* was the same species. I first met with it in Ireland in 1908, whilst in 1912 it was submitted to me by Dr. Randall Jackson, who had collected it in some plenty from the summits of Helvellyn and Ben Nevis. So far as I am aware, it has only been recorded from Fair Head, Co. Down (Carpenter), and therefore I have brought together the records known to me. It is usually to be found plentifully under the stones of screes on the slopes of mountains.

N. IRELAND: ANTRIM, Fair Head, 1905 (Carpenter); ARMAGH, shores of L. Neagh near Lurgan, ix.08 (R.S.B.). SCOTLAND: INVERNESS-SHIRE, slopes of Ben Nevis at 4,000 feet, 1912 (A. Randall Jackson), and PERTHSHIRE, on Ben More at c. 3,000 ft., ix.25 (R.S.B.). ENGLAND: NORTHUMBERLAND, near summit of Cheviot, 2,500 ft., common, 1912 (R.S.B.); CUMBERLAND, summits of Helvellyn, 1912 (A. Randall Jackson); Skiddaw at c. 2,500 ft., vi.16, and Sunday's Crag, near Patterdale, at 2,500 ft., v.15 (R.S.B.). EIRE: CORK, summit of Healy Pass, 1,084 ft., 17.ix.39, and Sugar Loaf, Cahah Mountains, 1,800 ft., one example in Sphagnum, 13.ix.39 (J. Litster).

3 St. Helen's Terrace,

Low Fell, Gateshead-on-Tyne.

October 27th, 1939.

## NEW SPECIES OF STAPHYLINIDAE (COL.) FROM JAVA.

BY MALCOLM CAMERON, M.B., R.N., F.R.E.S.

## OXYTELINAE.

**Thoracophorus javanus** sp.n.

Rather dull, dark ferruginous red. Antennae and legs reddish-yellow. Length 2 mm. Colour and lustre of *philippinus* Bernh., but larger and more robust, the head broader with less developed basal keels, the antennae a little stouter, sides of thorax closely and distinctly crenulate, elytra each with six keels.

Head a little narrower than the thorax (3 : 3.75), the posterior angles obtuse but prominent, the anterior margin rounded, close behind it with a curved ridge interrupted in the middle; at the base with a pair of nearly parallel sharp keels; strongly coriaceous. Antennae with five-jointed club. Thorax transverse (3.75 : 2.5), the sides parallel and closely crenulate, anterior angles rounded and prominent, the base truncate in the middle, oblique and feebly sinuate on each side, the posterior angles obtuse and prominent; the surface with four keels, the lateral oblique and sharp, extending from the anterior border to the posterior angle, the median pair widely separated and bifurcate in front, the surface between with some indistinct longitudinal striae; strongly coriaceous. Elytra longer (3.5 : 2.5) and broader than the thorax, transverse (4 : 3.5), each with six keels, of which the third is much less distinct than the others; strongly coriaceous. Abdomen with close longitudinal ridges on the first three segments, less close and more obsolete on the following; strongly coriaceous.

E. JAVA: Djember (*C. J. Louwerens*). Unique. My collection.

**Stenus (Hypostenus) louwerensi** sp.n.

Shining, head, elytra (except for the extreme base), posterior two-thirds of the 5th visible tergite and whole of the 6th black, the thorax, extreme base of elytra and rest of abdomen red. Antennae, palpi and legs yellow, the 6th to 8th joints of the former and the bases of the middle and posterior tibiae infuscate. Length, 5.5 mm. Colour of *elegantulus* Cam., but larger and more robust, thorax more closely punctured, elytra longer, the abdomen much less punctured.

Head a little narrower than the base of the elytra, broadly and distinctly bisulcate, with narrow raised impunctate median space, elsewhere closely and moderately finely punctured. Antennae slender, reaching the base of the thorax, all the joints longer than broad. Thorax longer than broad (3.5 : 2.5), the sides gently rounded for the anterior three-fourths, straight and retracted for the posterior fourth, rather coarsely and rather closely punctured. Elytra broader and a third longer than the thorax, as long as broad, the puncturation a little coarser and closer and with a very fine and obsolete ground sculpture. Abdomen a little narrowed at apex, finely coriaceous, the first four visible tergites strongly constricted at their bases and there more coarsely and closely punctured, more finely and sparingly elsewhere, the last two segments moderately closely but

obsoletely punctured.

♂ unknown.

E. JAVA: Djember (*C. J. Louwerens*). Unique. My collection.

#### PAEDERINAE.

##### *Astenus louwerensi* sp.n.

Head and thorax pitchy-black, only slightly shining; the elytra shining pitchy-black, the posterior margin and sutural region broadly and indeterminately reddish-yellow; abdomen shining, the first four visible tergites red, the following black. Antennae and legs entirely reddish-yellow. Length, 4 mm. Build of *gratellus* Fauv. but smaller and narrower, differently coloured, the antennae longer, sculpture of head and thorax less coarse.

Head with the post-ocular region completely coarctate with the base and with the usual reticulate-umbilicate sculpture. Antennae very long and slender, all the joints much longer than broad. Thorax longer than broad (5.5:4), trapezoidal, the sculpture as on the head. Elytra as long as, but broader than, the thorax, shining, rather coarsely and rather closely punctured. Abdomen with the first four visible tergites rather coarsely and closely punctured, the last two much more finely and sparingly. Anal styles yellow.

♂ unknown.

E. JAVA: Djember (*C. J. Louwerens*). Unique. My collection.

##### *Lathrobium cafrum* Boh. subsp. *javanum* n.

This subspecies differs from the type form in the smaller average size (5.5 mm.), slightly shorter antennae, more closely punctured base and sides of the head and much more closely punctured sides of the thorax; the last two abdominal tergites are also more or less extensively infuscate.

S. JAVA: Tjilatjap (*F. C. Drescher*). Two examples. My collection.

#### ALEOCHARINAE.

##### *Brachida javana* sp.n.

Shining; head, thorax and abdomen yellowish-red, the latter a little infuscate before the apex; the head somewhat infuscate at the base; the elytra brownish-yellow. Antennae black, the first four joints and legs reddish-yellow. Length, 1.75 mm. In build and colour somewhat like *crassiuscula* Kr., but much smaller, the elytra shorter and more yellow in colour.

Head narrower than the thorax (3:3.5), transverse, the eyes nearly as long as the post-ocular region, extremely finely and very sparingly punctured. Antennae moderate, the third joint narrower and a little shorter than the second, fourth small, transverse, the fifth and following more strongly so, the penultimate about a half broader than long. Thorax transverse (3.5:2.3), the sides

evenly rounded, the posterior angles rounded, extremely finely and very sparingly punctured. Elytra slightly longer and a good deal broader than the thorax (4.5 : 3.5), less finely and moderately closely punctured. Abdomen narrowed at base and apex, widest at the middle, extremely finely, moderately closely punctured on the anterior segments, much more sparingly behind, the pubescence sparing and rather long, the sides closely covered with long hairs. Head and thorax with sparing, stiff, more or less erect hairs, the elytra with longer and closer semi-erect pubescence.

E. JAVA: Djember (*C. J. Louwerens*). Unique. My collection.

***Coenonica louwerensi* sp.n.**

Fore-parts moderately, abdomen strongly shining. Head black ; thorax dark reddish-brown ; elytra blackish, indeterminately yellowish at the shoulders ; abdomen black, the first two visible segments obscurely yellowish. Antennae black, the first three joints and apex of the 11th reddish-yellow. Legs reddish-yellow, the tibiae more or less infusate. Length, 2.5-3 mm. Very like *philippina* Bernh. in build, but more robust, with longer antennae, the sculpture of the fore-parts coarser, but of similar character.

Head narrower than the thorax (3.7 : 4.5), the eyes large, longer than the post-ocular region, at the middle of the base with a short, shining keel, the front sparingly, elsewhere closely covered with large umbilicate punctures. Antennae stout, the third joint a little longer than the second, fourth and fifth a little longer than broad, sixth about as long as broad, seventh to tenth transverse, about a half broader than long, the eleventh a little longer than the ninth and tenth together. Thorax transverse (4.5 : 3), convex, the sides rounded in front and with a seta about the middle, retracted and a little sinuate before the obtuse posterior angles, before the middle of the base with a V-shaped impression, the whole surface closely covered with coarse granules. Elytra longer (4 : 3) and broader than the thorax, the sculpture very similar but not quite so close, with a seta at the shoulders and another about the middle of the sides. Abdomen a little narrowed before the apex and except for a transverse row of small punctures near the posterior margins of the segments, impunctate, the sides and apex with long black setae.

Sexual differences not apparent (? ♀ ♀).

E. JAVA: Res. Kediri, Samberbajem (*C. J. Louwerens*). Two examples. Type in coll. Louwerens, cotype in my collection.

***Tachyusa (Caliusa) javana* sp.n.**

Shining ; head black ; thorax red ; elytra black with the humeral angles reddish ; abdomen with the first two visible segments and base of the third red, the following black. Antennae black, the first three joints and legs yellow. Length, 3.5 mm. Very like *ferialis* Er., but with broader thorax and differently coloured elytra.

Head round, nearly as broad as the thorax, very finely and sparingly punctured, indistinctly coriaceous. Antennae with the third joint almost as long as

the second, fourth to tenth all longer than broad, decreasing in length, the penultimate only slightly longer than broad, the eleventh as long as the ninth and tenth together. Thorax as long as broad, the sides rounded in front, retracted and a little sinuate behind, the posterior angles obtuse; before the scutellum with a small impression, with fine, moderately close, asperate punctures; ground sculpture very feeble. Elytra broader and slightly longer than the thorax, transverse, the puncturation finer and rather closer. Abdomen a little widened towards the apex, the basal impressions of the first three visible tergites closely and rather coarsely punctured, elsewhere very finely and sparingly.

E. JAVA: Djember (*C. J. Louwerens*). Unique. My collection.

Zoological Museum,

Tring, Herts.

January 22nd, 1940.

### Reviews.

'THE MIND OF THE BEES.' By J. FRANÇON. Translated by H. ELTRINGHAM, F.R.S. 8vo, xi+146 pp. London: Methuen & Co. Ltd. 1939. Price 6s.

'THE LANGUAGE OF BEES.' By PROF. K. VON FRISCH. Smithsonian Report for 1938, pp. 423-431. 1939.

These two fascinating studies of bee behaviour are complementary and should be considered in relation to one another. Monsieur Julien Françon's stimulating and human book first appeared in France under the title 'L'Esprit des Abeilles.' In it we recapture all the thrills of first reading the 'Souvenirs' of his immortal countryman, Jean Henri Fabre. As Fabre was fortunate in his translators, so too is Françon, and our old friend Dr Harry Eltringham, already well-known to us as a skilled Lepidopterist, histologist, artist, craftsman and oarsman, stands revealed in a new light. It must be pointed out that Prof. von Frisch's material was delivered as a lecture at University College, London, in March, 1937, appeared in the same year in *Science Progress*, 32: 29-37, and is now reprinted. A more detailed account of the work was published in 1923, *Zool. Jahrb., Abt. Zool. Phys.*, 40: 1-186. In the pamphlet now before us he is much more concise than Françon, who has set himself the task of writing in popular vein with highly successful results.

Both authors experimented with marked bees, attracted to honey or sugar-water, and both maintain that these insects are able to communicate to other bees information concerning an abundant and easily secured supply of food; these then help the original finder. V. Frisch shows that this is accomplished in the course of a kind of dance in the hive, but he believes that the information so conveyed is of a general nature, as the bees 'flew out in all directions' in search of the experimental dishes. Françon's 'assistant' bees, however, seemed to show complete knowledge of the position and means of access to the most unnatural and complicated contrivances. Both works have sections on the colour vision of bees, while v. Frisch discusses the senses of taste and smell, and alludes to the use of an abdominal scent organ in attracting other bees which may be near the special source of food.

The two publications will be read with interest by general entomologists, bee-keepers and students of insect psychology. Indeed, they are so stimulating, and the experiments so capable of universal application, that only the rigorous rationing of sugar prevents the reviewer from quitting his study table to commence marking bees forthwith.

'THE MOTHS OF THE BRITISH ISLES.' By R. SOUTH. Edited and revised by H. M. EDELSTEN. 8vo, First Series, pp. vii+360, 159 pls., 26 figs; Second Series, pp. vii+399, 159 pls., 20 figs. London: F. Warne & Co. Ltd. 1939. Price 10s. 6d. each volume.

For more than three decades this fine work, and the companion volume on British butterflies, have been used with pleasure and profit by all classes of naturalist from schoolboy tyro to research worker. Perhaps it would be correct to say that no entomological books published in Britain during the present century have had so wide an appeal or such a long life.

With the passage of time, however, some revision became inevitable, and this has been very successfully achieved by Mr. H. M. Edelsten in the face of the severe limitations imposed upon him by the continued use of the original plates of type. Modifications are therefore confined to small verbal changes, additions and corrections, which, although not extensive in themselves, together make a vast difference to the accuracy and usefulness of the book. Additional information, too long for inclusion in the text, has been embodied in the two appendices. The most striking changes are in nomenclature, but the names adopted represent the carefully considered findings of the editor, Mr. W. H. T. Tams and other experts at the British Museum (Nat. Hist.) after a close and long overdue examination of original sources and proper regard for the International Rules; advantages which should secure for these names not only an immediate following, but also stability in the future. One slight disadvantage resulting from the use of the original plates in combination with the new nomenclature is that the old order of species sometimes differs from that which would now be adopted, in a few cases even separating species to-day considered congeneric. A more serious matter is the continued omission of authorities for trivial names, which, it would appear, could easily have been introduced at the time of such sweeping alterations in the various headings. On the other hand, life-histories and distribution lists, including those for Ireland, have been brought up to date, while there are new general and specific indexes.

In conclusion, we must point out that the 'Small Fry,' as South called them in the preface to the first edition of his second volume, have still been left 'for separate treatment at some more convenient season.' Is it too much to hope that Messrs. Warne & Co. will one day give us a similar volume with enlarged illustrations of Microlepidoptera? These volumes are so good that, like *Oliver Twist*, we have no hesitation in asking for more.

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*Gnorimus nobilis* L. (Col., Scarabaeidae) in Kent. — The larva of this interesting and extremely local green chafer beetle feeds upon the wood mould of old, partially decayed fruit trees, more especially the plum. A few larvae were found in a decayed plum tree at East Malling in April, 1928, but it has not been seen again until last year, when larvae were found in numbers in the wood mould of an old Keswick Codling apple tree at East Malling. Some of the larvae were boring into the heart-wood of the tree, but the majority seemed to prefer the decayed portions. It is evident that this insect has been breeding in the tree for several years, and the owner of the orchard informs me that he has noticed for a number of seasons a green woodpecker 'working' the tree trunk to procure the larvae. The larvae were collected and placed in cages containing wood mould. Eleven pupae were noted in one cage at the end of February, and three adults emerged on the 17th March. When breeding this species great care must be taken to keep the wood mould in a moist condition, but it is fatal to damp it too much.—A. M. MASSEE, East Malling Research Station, Maidstone, Kent: March 19th, 1940.

THE INSECT FAUNA OF A NEST OF THE SILVERY-CHEEKED  
HORNBILL, INCLUDING THE DESCRIPTION OF *OECORNIS*  
*NIDICOLA* G. ET SP.N. (COL., CARABIDAE) FROM TANGANYIKA.

BY EVERARD B. BRITTON, M.SC., F.R.E.S.

In the course of an investigation of the breeding biology of the Silvery-cheeked Hornbill (*Bycanistes cristatus* Rüpp.), Mr. R. E. Moreau has sent the insects found in a nest at Amani, Tanganyika, to the Department of Entomology, British Museum (Natural History), for examination. The peculiar habits of the Hornbill lend a special interest to the insect fauna of the nest. I am therefore indebted to Mr. Moreau for his kind permission to quote at length from his notes. He writes as follows:—

‘The main outlines of the peculiar breeding biology of the Hornbills (Bucerotidae) are now fairly well known, especially in Africa, though they have very frequently been misrepresented. Except in the aberrant Ground-Hornbills, the females, working from inside the nest-hole, seal up the entrance with material, brought to them wholly or in part by the male, until only a slit is left, too narrow to allow them to emerge. They then remain inactive in the nest for a period of 60-120 days, according to the species; some emerge when the young are only partly feathered, others not till the young are ready to fly. Throughout the long period that the nest is occupied, the males supply the inmates with food. Some species are mainly insectivorous, others wholly frugivorous; and it is known that about 24,000 fruits entered a nest of one of the latter species during the time it was occupied. The birds give much attention to the sanitation of the nest. They defaecate forcibly and with some accuracy through the slit; they throw out rubbish, such as regurgitated fruit-stones; but with so much fresh organic matter being introduced into the nest it would seem certain that there would be enough débris to encourage, in the protected conditions and constant high temperature, a good insect population. Perhaps the only published reference to the insects in a hornbill’s nest is that of Chapin (*in litt.*) as quoted by Moreau (1937, *Proc. Zool. Soc. Lond.*, A, **107**: 340). He found in a nest of *Bycanistes albotibialis* Cab. & Reichw. in the Congo a number of wingless cockroaches, which were thought to be coprophagous, and a few larvae, perhaps of Tineid Lepidoptera.’

In January, 1937, Mr. Moreau took the opportunity of collecting the contents of a nest which had been opened to extract a young bird. The nest contents consisted almost entirely of pieces of more or less rotten wood derived from the walls of the hole, and a few

scraps of bark. There was no obvious dung or food débris. The material was, in fact, dry, inoffensive and almost odourless. The insects sorted out of this material and received at the British Museum numbered 438 individuals, made up as follows:—

#### HEMIPTERA: HETEROPTERA.

CYDNIDAE.—*Chilocoris laevicollis* Horvath; 86 adults and 37 nymphs. Identified by Mr. W. E. China, who has informed me that the only Cydnidae of which any biological facts are known are phytophagous, living on the ground or burrowing into the soil at the roots of grass, etc. No explanation can be offered of their breeding in the nest.

#### COLEOPTERA.

CARABIDAE.—(A), *Oecornis nidicola* g. et sp.n. (described below); 2 examples. (B), 15 larvae of one species, probably of the tribe Lebiini. It is quite probable that these are the larvae of *Oecornis nidicola*. Dr. F. van Emden considers that, while these larvae unite characters of the Colliurini, Lebiini and Masoreini, they are probably best referred to the Lebiini. Within the tribe they show affinities with the subtribes Lebiina, Cymindina and perhaps with the Dromiina, and certainly have no relations with the Coptoderina and Calleidina.

ELATERIDAE.—15 larvae of one species, probably of the subtribe Elaterina. Biology unknown.

TENEBRIONIDAE.—35 larvae of a species of, or near, the genus *Alphitobius*. Probably feeding on fungi and rotten wood.

#### LEPIDOPTERA.

COLEOPHORIDAE.—201 larvae.

#### ORTHOPTERA.

BLATTIDAE.—43 nymphs of a new species of *Trichomera* or a closely allied genus. (Determined by Mr. K. H. Chapman.)

#### DIPTERA.

ACALYPTERAE.—4 larvae.

I wish to thank Dr. F. van Emden for the identifications of the larvae, and for his valuable advice in connection with this work.

It is noteworthy that of the eight species found in the nest-hole at least seven were breeding there. The value of collecting the insects from any Hornbill's nest that may be opened is obvious from the fact that of the eight species recorded above, at least two



are new to science, while the appearance of two of the others was unexpected, in that related species have quite different habits.

On the same date in the following year, 1938, the contents of the same nest-hole were again collected by Mr. Moreau, who writes: 'The nest-hole would not have been so warm and dry as when the Hornbills were in residence, but the main difference in the conditions of the interior would certainly have been the absence of food remains in various forms. The insect fauna had changed entirely since the previous year. Apart from scores of adult cockroaches of the family Panchlorinae, there were only a few Dipterous larvae of three species and Elaterid larvae of one species. The abundance of insects breeding in the hole in the first year thus evidently depended on the Hornbills, and the thoroughly sanitary state of the nest must owe much to their scavenging activities.'

### *Oecornis* g. nov.

GENOTYPE: *Oecornis nidicola* g. et sp. n.

The whole *body*, including the legs, but with the exception of the head and the sides of the pro- and meso-sternum, sparsely pubescent. *Pronotum* strongly transverse, with very distinct excisions of the basal margin on either side, so that the middle of the base has the appearance of a short wide lobe; lateral margins thick, not explanate or reflexed; the lateral margins and the sides of the anterior and posterior margins fringed with long, stiff setae. These setae, unlike the normal tactile setae, are evidently homologous with the shorter hairs which form the pubescence. *Head* short and thick; antennae compressed and short, about one-third total length of the body, the fourth to eleventh segments more densely pubescent than the basal segments, but bare along the middle part of each flat surface; labrum as long as broad, the anterior margin convex; mentum with a prominent median tooth; palpi fusiform and truncate at their apices; ligula narrow at the apex, which bears two setae; paraglossae broad, hyaline, equal in length to the ligula. *Elytra* depressed, striae obsolete, the intervals only distinguishable by their very slight convexity, the third interval with two setiferous punctures; the margins around the shoulders, and to a lesser extent along the sides, fringed with long, stiff setae, like those of the pronotum; setae of the marginal series of setiferous punctures of the elytra (fourteen in number) very long and slender; basal margin of the elytra reduced, absent towards the scutellum; apical margins with a very narrow, thickened border; scutellum densely punctured and pubescent. *Claws* simple, intermediate tibiae in male without an excision on the inner side near the apex; fourth tarsal segments emarginate at their apices. *Wings* fully developed (fig. 3).

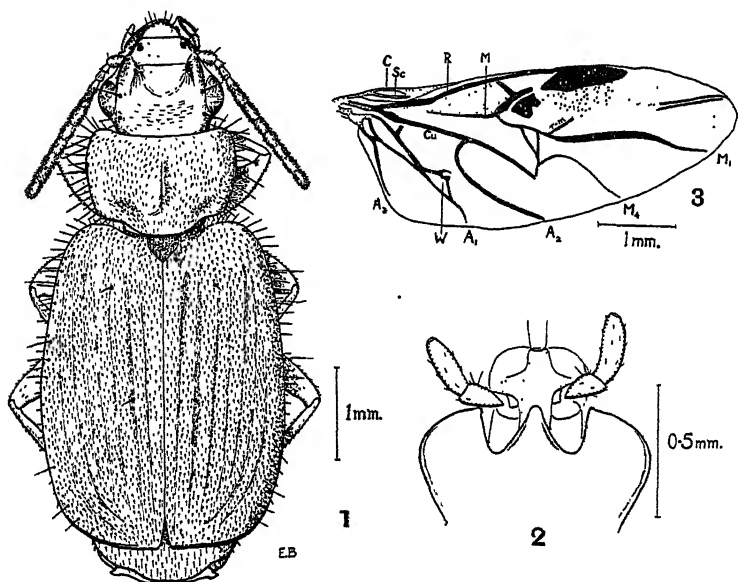
### *Oecornis nidicola* g. et sp. n.

*Length* 6—7 mm. Head, pronotum and elytra, including the elytral epipleurae, black. Pygidium testaceous. Ventral surface testaceous, with head black and proepisterna piceous. Mouth-parts reddish-brown; antennae red, segments 4—11 darker. Legs reddish-brown. Pronotum transverse, ratio maximum width/middle length = ca. 1.6; posterior angles rounded.

TANGANYIKA: Amani, from a nest of *Bycanistes cristatus* Rüpp.,

the Silvery-cheeked Hornbill, i. 1937 (R. E. Moreau). *Holotype* and *paratype* in the British Museum.

*Oecornis*, although undoubtedly a Lebiine genus, occupies a peculiarly isolated position within the tribe. In a number of characters it shows a quite remarkable parallelism with *Somotrichus* Seidlitz. Both genera have the body pubescent, the pronotum transverse, with a basal lobe, the head short and thick, the antennae unusually short and compressed, the labrum convex in front, the mentum with a prominent median tooth, palpi fusiform and truncate at their



FIGS. 1—3. *Oecornis nidicola* g. et sp.n.; 1, male; 2, labium and mentum; 3, wing (veins identified according to the system of W. T. M. Forbes, 1922, *Ann. Ent. Soc. Amer.*, 15: 328-43).

apices; the elytral striae obsolete, basal margin of the elytra absent, 4th tarsal segments slightly emarginate at their apices, and the margins of both pronotum and elytra fringed with long, stiff setae. *Oecornis*, however, differs markedly from *Somotrichus* in having simple tarsal claws, whereas in the latter genus these are serrate on the inside. The little-known genus *Brachynopterus* Bedel (1898, *Bull. Soc. Ent. Fr.*, 1898: 241, f. 2) probably approaches *Oecornis* more closely than any other known Lebiine genus. *Brachynopterus* was described from an individual taken in Algeria. I have seen no examples, but it is clear from the description and figure that the

genus resembles *Oecornis* in the following characters:—Pronotum narrowed posteriorly, with posterior angles blunt and a distinct basal lobe; sides of the pronotum with setae additional to the normal two; anterior margin of the labrum convex; elytra with shoulders rounded, without basal margins, but fringed with a number of stiff setae; striae obsolete; 4th segments of tarsi normal, not bilobed or deeply emarginate; claws simple; the pronotum, elytra and abdomen thinly pubescent. *Brachynopterus* appears to differ from *Oecornis* mainly in that the antennae are long, extending well beyond the base of the pronotum, in the smaller number of bristles on the sides of pronotum and elytra, the less transverse pronotum, and in the elytra, which are more rounded and convex.

Department of Entomology,  
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February 1st, 1940.

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*Ceratitis capitata* Wied. (Dipt., Trypetidae) in Middlesex.—Although the Mediterranean Fruit Fly is frequently introduced into this country in imported fruits, there does not appear to be a recent record of the fly actually breeding in this country under natural conditions. It is of interest, therefore, to describe briefly the rearing of two specimens from apple.

A number of Cox's Orange Pippin apples, gathered from a bush tree growing in a small garden at South Harrow, Middlesex, were found to be infested with small whitish maggots. The fruit was sent to East Malling with a request for the determination of the species, and also suggestions for its eradication. An examination of the fruits disclosed the presence of small white maggots tunneling in the flesh. No trace of injury could be seen on the surface, but one or two soft areas just under the skin suggested that the fruits had been slightly bruised. On cutting open the apples it was apparent that the soft areas had been caused by the maggots feeding just under the skin. The type of injury caused to the fruits is characteristic of that made by another apple pest, namely, the Apple Fruit Miner (*Argyresthia conjugella* Zell.). Two specimens were bred, however, in the third week of November, 1939, and they proved to be a male and female of *Ceratitis capitata* Wied.

Although several more larvae were found in the fruits, they did not mature and no more adults emerged. The owner of the garden states that he has four trees, three apples and a pear. Of these, only the Cox fruit was infested, some of the fruits dropping prematurely as the result of attack. Needless to say, all the fruits in the garden have been collected and destroyed, and the soil under the trees treated with an insecticide as a precautionary measure. It may be significant that a green-grocer's shop is situated quite near the garden, and it is reasonable to suggest that the flies came from this source in the first place, and temporarily established themselves on the Cox fruits growing in the garden.

The writer is indebted to Dr. F. W. Edwards for the following reference to the original record of this insect breeding under natural conditions in this country in pear fruits at Peckham Rye: Newman, E., 1869, *Entomologist*, 4: 183-8.—A. M. MASSEE, East Malling Research Station, East Malling, Kent: April 4th, 1940.

THE PARASITES OF BRITISH BIRDS AND MAMMALS. XXII.  
ADDITIONAL RECORDS OF *ORNITHOMYIA* spp. FROM BRITISH  
BIRDS, TOGETHER WITH NOTES.

BY GORDON B. THOMPSON.

Since the publication of No. XIX of this series of papers (1938, *Ent. mon. Mag.*, 74: 129-33) many more specimens of Hippoboscidae have come to hand. The greater part of this material has come to me through the kindness of ornithologists who are engaged in bird-ringing. In a recent letter to the editors of *British Birds* (1938, 31: 360) I made an appeal to those engaged in bird-ringing to collect ectoparasites, especially Hippoboscidae, and listed five points concerning which I am anxious to obtain data. These five points, referring to Hippoboscidae, are as follows:—1, The earliest and latest dates when these flies are observed; 2, whether the puparia are observed among the feathers or the nests of the birds; 3, whether juvenile birds are more frequently parasitised than adults; 4, the extent to which birds carry these flies on migration; 5, the species of birds parasitised by the bird-flies.

The present paper contains records of the two species of *Ornithomyia* found on seventy-six birds. I should like to pay special tribute to the painstaking manner in which Mr. Arnold Clark has helped me in these investigations. Mr. Clark kept detailed records of all the birds examined by him for ringing, thus supplying a wealth of information.

Referring again to the points listed above, the records contained in this paper enable me to present additional information concerning points 1, 3 and 5. The earliest and latest dates of capture of *Ornithomyia* spp. still stand at April and November. An analysis of a total of 133 records to date shows that these flies are most abundant during July and August. It is quite evident now that juvenile birds are much more frequently parasitised than the adults. Out of a total of 55% of the number of birds parasitised, 89% were juveniles and only 11% were adults. These facts are in complete agreement with the findings of C. W. Johnson (1929, *Bull. N.E. Bird-banding Ass.*, 5 (2): 49-52).<sup>\*</sup> With regard to the extent to which birds are parasitised by *Ornithomyia* spp., on the basis of Mr. Clark's observations 55% of the total number examined bore one or more specimens of these bird-flies. The greatest number of flies taken on an individual bird during the past season was six. During the course of Mr. Clark's ringing and parasite collecting a few birds were caught on more than one occasion in the trap. Some of these birds

<sup>\*</sup> See notes on Johnson's paper in my paper, cited above.

had acquired further parasites when trapped the second time. It seems, therefore, that the *Ornithomyia* are very active and abundant during the summer months. Only one puparium was received during the season, and this was deposited by a female after it had been tubed.

With regard to the species of birds parasitised by the two species of *Ornithomyia*, the additional records contained in the present paper again show that *O. avicularia* (Linn.) is primarily a parasite of crows, starlings, blackbirds, thrushes, hawks, etc., whereas *O. fringillina* Curtis is primarily a parasite of the smaller passerine birds, waders, etc. It must be borne in mind when considering the present records that different species of birds were at times together in the trap, and specimens of the flies may have become transferred from one bird to another.

An analysis of the total number of specimens of *Ornithomyia* spp. contained in the table given below gives a total of 61.5% females and 38.5% males. Females are, therefore, very much more abundant than males.

An interesting fact regarding the distribution of the two species of *Ornithomyia* has emerged from all the records which I have published to date. *O. avicularia* (Linn.) seems to be absent from Scotland. Admittedly I have had but few records from Scotland, but those which have come to hand have all been *O. fringillina* Curtis.

The following figures refer to records kindly sent to me by Mr. Clark:—

	Starling.	Chaffinch.	Whitethroat.	Song-Thrush.	Blackbird.	Robin.	Hedge-Sparrow.
	ad. juv.	ad. juv.	ad. juv.	ad. juv.	ad. juv.	ad. juv.	ad. juv.
June .....	— —	— —	— —	— —	2 4	— —	— —
July .....	— 1	— 2	— 2	— 4	— 2	— 1	1 4
August .....	— 10	— —	— —	1 —	1 11	1 5	— 7
September .....	— —	— —	— —	— —	— —	1 1	— —
Total No. of birds parasitised .....	11	2	2	5	20	9	12
Total No. of birds examined .....	36	11	5	5	29	12	14

Grand total of birds examined ..... 112 = 43 adults and 69 juveniles.

Grand total of birds parasitised ..... 61 = 7 adults and 54 juveniles.

Grand total of birds not parasitised ..... 51 = 36 adults and 15 juveniles.

Percentage parasitised = 55% approx., of which 11% adults and 89% juveniles.

In the detailed list the names of the parasitised birds are followed by locality of capture, observer's initials, sex and age of bird, if known (ad. = adult, juv. = juvenile, imm. = immature), day and month of capture (all records are for the year 1938), number and sex of parasites (*a* = *Ornithomyia avicularia* (L.); *f* = *O. fringillina* Curtis).

## CORVIDAE.

*Corvus monedula spermologus* Vieil. (Jackdaw).—Wales, Cardigan, Emlyn, Newcastle (J.G.W.): imm., albino, 15.vii, 1 ♀ *a*.

## STURNIDAE.

*Sturnus v. vulgaris* L. (Starling, juv.).—Kent, Longfield, Hartley (A.C.): 27.vii, 2 ♂♂ *a*; 5.viii, 2 ♀♀ *a*; 6.viii, 1 ♂ *a*; 6.viii, 1 ♀ 1 ♂ *a*; 15.viii, 1 ♀ *a*; 15.viii, 2 ♀♀ *a*; 18.viii, 1 ♀ *a*; 18.viii, 3 ♀♀ *a*; 18.viii, 1 ♀ *a*; 18.viii, 2 ♀♀ 1 ♂ *a*; 19.viii, 1 ♀ *a*.

## FRINGILLIDAE.

*Passer d. domesticus* L. (House Sparrow).—Sutherland, Dornoch (E.C.): ♀ or juv., 2.vii, 1 ♀ *f*; juv. fledged, 2.vii, 1 ♀ <sup>1</sup>. Hartley (A.C.): 4 juv., 16.vii, 3 ♀♀ 1 ♂ *a*, 1 ♀ *f*.

*Fringilla c. coelebs* L. (Chaffinch, juv.).—Hartley (A.C.): 16.vii, 1 ♀ *a*; 22.vii, 1 ♀ *a*.

## SYLVIIDAE.

*Sylvia c. communis* Lath. (Whitethroat, juv.).—Hartley (A.C.): 13.vii, 1 ♂ *a*; 17.vii, 1 ♀ 1 ♂ *a*.

## TURDIDAE.

*Turdus e. ericetorum* Turton (Song Thrush).—Hartley (A.C.): juv., 21.vii, 1 ♀ *a*; juv., 25.vii, 1 ♂ *a*; juv., 29.vii, 1 ♂ *a*; juv., 29.vii, 1 ♀ *a*; ad., 4.viii, 3 ♀♀ 2 ♂♂ *a*. Cheshire, Wilmslow (E.C.): 25.viii, 1 ♀ *a*.

*Turdus m. merula* L. (Blackbird).—Hartley (A.C.): juv.,<sup>2</sup> 24.vi, 1 ♂ *a*; juv.,<sup>2</sup> 7.vi, 1 ♂ *a*; ad. ♂, 13.vi, 1 ♀ *a*; juv.,<sup>2</sup> 17.vi, 1 ♀ 1 ♂ *a*; juv.,<sup>2</sup> 21.vi, 4 ♀♀ 2 ♂♂ *a*; ad. ♂, 27.vi, 1 ♂ *a*; juv., 22.vii, 1 ♀ 1 ♂ *a*; juv., 27.vii, 1 ♀ 1 ♂ *a*; juv.,<sup>2</sup> 2.viii, 1 ♀ *a*; juv., 2.viii, 1 ♀ *a*; juv., 2.viii, 3 ♀♀ 3 ♂♂ *a*; juv.,<sup>2</sup> 2.viii, 1 ♀ 1 ♂ *a*; juv., 3.viii, 1 ♂ *a*; juv.,<sup>2</sup> 4.viii, 2 ♀♀ 1 ♂ *a*; ad., 4.viii, 1 ♂ *a*; juv., 5.viii, 2 ♀♀ *a*; juv., 5.viii, 2 ♀♀ 1 ♂; juv.,<sup>2</sup> 6.viii, 4 ♀♀ 1 ♂; juv.,<sup>3</sup> 6.viii, 1 ♂; juv., 14.viii, 2 ♀♀ 1 ♂.

*Erithacus rubecula melophilus* Hart. (Robin).—Hartley (A.C.): juv., 11.vii, 1 ♀ *f*; juv., 6.viii, 1 ♀ 1 ♂ *f*; juv.,<sup>3</sup> 12.viii, 1 ♀ *f*; juv.,<sup>3</sup> 14.viii, 2 ♂♂ *f*; ad., 14.viii, 1 ♀ *f*; juv., 15.viii, 1 ♀ *f*; juv., 15.viii, 1 ♀ 1 ♂ *f*; 1st winter, 15.ix, 1 ♀ *f*; ad., 25.ix, 1 ♀ *f*.

## PRUNELLIDAE.

*Prunella modularis occidentalis* Hart. (Hedge Sparrow).—Hartley (A.C.): juv.,<sup>4</sup> 4.vii, 1 ♀ *a*; juv., 14.vii, 1 ♀ *a*; ad., 23.vii, 1 ♂ *f*; juv., 26.vii, 1 ♂ *f*; juv.,<sup>2</sup> 28.vii, 3 ♀♀ *f*; juv., 4.vii, 1 ♂ *a*; juv., 4.viii, 2 ♀♀ *f*; juv., 7.viii, 1 ♀ 1 ♂ *f*; juv.,<sup>2</sup> 14.viii, 1 ♂ *a*; juv.,<sup>2</sup> 16.viii, 1 ♀ *a*; juv., 18.viii, 1 ♀ *a*; juv., 18.viii, 1 ♀ *f*.

<sup>1</sup> Deposited a puparium after capture.

<sup>2</sup> These birds have been examined on more than one occasion.

<sup>3</sup> No Hippoboscidae observed when examined a few days previously.

<sup>4</sup> Escaped before examination completed; at least one more Hippoboscid present.

## FALCONIDAE.

*Accipiter n. nisus* L. (Sparrow Hawk).—Radnorshire, Llanbwchllyn (J.G.W.): imm. ♂, 8.vii, 1 ♀ a.

## SCOLOPACIDAE.

*Tringa t. totanus* (L.) (Common Redshank).—N.W. Lanarkshire, Garguddie (P.C.): ad. ♀, 25.vi, 1 ♂ f.

*Numenius a. arquata* (L.) (Curlew).—Sutherland, Glen Noth (E.C.): 6.vii, 6 ♀ ♀ f.

## CHARADRIIDAE.

*Pluvialis a. apricarius* (L.) (Southern Golden Plover).—E. Renfrewshire, nr. Eaglesham (P.C.): ad. ♂, 18.vi, 1 ♀ f.

*Vanellus vanellus* (L.) (Lapwing).—Sutherland, Borrobol (E.C.): juv., 6.vii, 1 ♀ 1 ♂ f. Sutherland, Dornoch (E.C.): 5.vii, 1 ♀ f. Sutherland, Kildonan (E.C.): vii, 1 ♀ f.

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March 4th, 1940.

A NOTE ON THE GENERIC NAME *LARA* LECONTE (COL., ELMIDAE).

BY H. E. HINTON, PH.D.

Leconte (1852, *Proc. Acad. nat. Sci. Philad.*, 6: 42) proposed the name *Lara avara* for a new genus and species of beetle which he placed in the family Parnidae, division Dryopini. Previous to this, Drapiez (1819, *Ann. gén. Sci. Phys. (Bruxelles)*, 1: 54) gave the name *Lara jurinii* to a new species of wasp. I believe that *Lara* Leconte should be retained and not sunk as a homonym of *Lara* Drapiez. There are at least two good reasons for believing that Drapiez had no intention of describing a new genus, and that his *Lara* is a misprint for *Larra* of Fabricius. In the first place, he states in the introduction to his paper (*op. cit.*, p. 45) that he is describing eight new species and says nothing about describing a new genus. In the second place, he says (*op. cit.*, p. 46), 'Ces espèces seront classées suivant la méthode publiée par Latreille . . .' and Latreille (1805, *Hist. Nat. Gen. Crust. Ins.*, 13: 295) spells the name *Larra*, never *Lara*. If further proof be needed, it should be remembered that by 1819 separate generic diagnosis had become the general rule when describing a new genus.

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January 10th, 1940.

'Stridulation' in *Nymphalis io* L. (Lep.).—In December last, when my gardener and I were moving some logs from a woodstack, one near the base was seen to bear a hibernating Peacock butterfly. So we placed this log carefully to one side where it was in bright sunshine. Almost immediately our attention was recalled to it owing to the production of a hissing sound which can be best described as something between that produced by an angry cat and the hissing of a disturbed snake. The volume of sound was also not dissimilar. I could not at first credit that so loud a noise was being produced by the insect, but it was soon apparent that the sound accompanied the movement of the butterfly's wings, which partially opened and closed in a manner similar to that when sunning itself normally. So far as one could judge, the sound was an outcome of the rubbing of the fore and hind wings against one another. The movement and sound continued for a few minutes. Subsequently, when the log was again moved, into a shed, the sound was again produced, but not nearly so loudly. On another occasion I disturbed a further hibernating specimen which was in an attic and, listening carefully, I could just detect a similar sound produced very faintly, so much so indeed that had it not been for my previous experience I have little doubt that the phenomenon would have passed unnoticed.—E. J. SALISBURY, Willow Pool, Radlett, Herts. : *March 22nd*, 1940.

*The food of Cuckoos.*—The following interesting note has been received from Captain J. D. McComish. 'On Norfolk Island, October, 1939, a bronze cuckoo (*Lamprocoryx lucidus* Gmelin) was shot and given to me. I found its stomach full of lady-birds, only one of which was undamaged. This I brought to Sydney and handed to the entomologist at the Australian museum, who identified it as *Callineda testudinaria* Mulsant, also found in Queensland, New South Wales and Tasmania. We did not see any living specimens on Norfolk Island, but should we return there we will look for them.' Once again we find a Cuckoo preying on insects furnished with unpleasant attributes. Hairy caterpillars are notoriously devoured by Cuckoos, and Coccinellidae, as a family, have many of the characteristics of protected insects.—G. D. HALE CARPENTER, Hope Department, University Museum, Oxford : *April 4th*, 1940.

*Typhlocyba froggatti* Baker (Hem.) definitely a British Insect.—This species was introduced into the British list by Mr. W. E. China last year (1939, *Ent. Mon. Mag.*, 75: 54) on the strength of the legend to fig. 212 in Ribaut's Monograph (1936, *Faune de France*, 31: 95, under the preoccupied name *T. australis* Frogg.). We can now state definitely that it occurs in Britain, as I obtained a specimen by beating hawthorn near Bridlington (Yorkshire, V.C. 61) as long ago as August, 1921, and which I have now been able to identify as *T. froggatti* with the aid of the paper mentioned above. Mr. China has been good enough to examine the specimen and my sketches made at the time of capture, and has confirmed my determination. The specimen has been presented to the British Museum (Natural History), S. Kensington.—JAMES M. BROWN, 'Carterknowle,' Robin Hood's Bay : *April 16th*, 1940.

*Insects caught in Flowers by the Proboscis.*—Mr. R. A. Lever's note (*antea*, p. 55) reminds me of a note by Mr. E. Jarvis (*Queensland Agricultural Journal*, April 1913, pp. 263—264, figs.) on 'Insects trapped in Oleander Blossoms,' in which he described how Muscid flies were found with the tip of the proboscis inextricably jammed in Oleander flowers—a similar case to that described by Mr. Lever.—T. BAINBRIGGE FLETCHER, Rodborough, Glos. : *March 9th*, 1940.



## Obituary.

ANDRÉ LÉON TONNOIR.—On April 11th, 1919, a letter signed 'André Tonnoir' was received at the British Museum and inscribed by the late Major E. E. Austen 'Passed to Mr. Edwards to deal with.' That letter marked the commencement of a friendly correspondence which has lasted for twenty years, but which can be carried on no longer. Tonnoir died in January last while on a week-end field excursion near Canberra. He was and will always be an outstanding figure in entomological, and especially dipterological, science.

At the time of our first introduction Tonnoir was attached to the Brussels Museum and was associated with Dr. M. Goetghebuer in the collection and study of Belgian Diptera. He was beginning to specialise in the Psychodidae and undertook to study the material of that family in the British Museum. A little later he and I found that we had been independently studying our local craneflies, and we had to arrange some friendly give and take in regard to the publication of our results. However, Tonnoir was soon to engage in a wider field of study.

Early in 1921 the late Dr. R. J. Tillyard was visiting Europe and made Tonnoir's acquaintance; he was much impressed with Tonnoir's ability and invited him to go to the Cawthron Institute for a year to study New Zealand Diptera. Tonnoir was fired with enthusiasm by this suggestion and was able to obtain from the Brussels University a substantial grant in aid of the proposed trip. In September of that year he actually left for New Zealand, and we met for a few hours when he passed through London. In May, 1922, he wrote to me from Nelson: 'Voilà déjà plusieurs mois que je parcours la Nouvelle Zélande de droite et de gauche et que je récolte des diptères sans trêve ni repos, mais tout cela ne fait pas mon bonheur.'

Apart from the natural difficulties of accommodating himself to such new surroundings, there were two things which interfered with Tonnoir's happiness. In the first place, he found himself in the midst of some personal disputes. As Tillyard put it to me: '... Altogether we are not a happy family ... it is very hard on Tonnoir ... However, he is a splendid fellow, and just smiles and says nothing.' These difficulties soon passed, for Tonnoir might well have been said to live, like George Fox, 'in the spirit and power which took away the occasion of all war.' He had no need to write 'je ne désire pas avoir la réputation d'un batailleur.' The other trouble was consequent upon a misapprehension. Before leaving Belgium Tonnoir believed that no one was then interested in New Zealand Diptera and that he had a completely clear field. He had therefore formed the plan of spending a year in assiduous collecting and on his return writing a monograph on New Zealand Diptera which might be published as a separate volume by the Brussels University. Great was his disappointment when he found that he was only taking part in a 'gold-rush' in which many others, including myself and Tillyard, had already staked claims, particularly in the groups in which he was most interested, and that 'il ne me restera que très peu de travail original à faire ici.' Yet how ludicrously false this conclusion was he must before long have realised, for he wrote, some years later, 'I have *tant de pain sur la planche* that I can never expect to go through it as there is so little time left to eat it.'

Meanwhile, fearing that his University might be dissatisfied with his results (!), he decided that he must at his own expense double the length of his proposed stay in the antipodes and visit another country where the Diptera were even less known than in New Zealand. Accordingly he spent the southern



[To face page 118]

A. L. TONNOIR IN 1922.

'The restless flycatcher *dans l'exercice de ses fonctions.*  
To his friend F.W.E.'



summer of 1922-3 in Tasmania. My father met him on the summit of Cradle Mountain, still collecting 'sans trêve ni repos,' even in the wettest of weather, when only aquatic insects and their larvae could be caught. Possibly it was this experience which led to the great interest in insect life-histories which was so well displayed in much of his later work.

At this period nearly every letter of his brought news of some startling new discovery. Once it was a strange little fly (afterwards found to have been described under the name *Sciadocera*) as to the affinities of which he was puzzled; he sent sketches of this to Bezzi as well as to me, and Bezzi thought it 'the most wonderful fly in the world'! Another time it was the larva of the New Zealand Scatopsid genus *Canthyloscelis*; I quote his account of this because it illustrates both his keenness in observation and his remarkable skill in technique:—

'What I'm going to tell you now will give you a shock; be prepared: the larva of *Canthyloscelis* is acephalous! . . . You'll remember that I told you I had bred *C. nigricoxa* from a pupa found in a rotten log, and to which was still attached the larval skin but that the head was lost. Well, it was not—after treating that skin with potash and blowing it to give it its previous form—which I have permanently preserved by introducing in it a small glass rod of proper shape and dimension—I found that the head was there, represented by a very tiny cephalic segment not different in texture from the rest of the body but bearing two microscopic antennae and presenting a mouth-opening surrounded by papillae and provided inside with a simple armature. I enclose sketches; near the antennae are two enigmatic sense-organs I've never seen before.'

Tonnoir carried out his plan of returning to Nelson via Sydney and Auckland, studying Skuse's types and collecting in the North Island of New Zealand. He completed his second year at the Cawthron Institute, but did not return to Belgium at the end of it. Instead he accepted an appointment at the Canterbury Museum, married and settled down. One of his many researches while at Christchurch was an investigation into the life-history of that eighth wonder the 'New Zealand Glow-worm' (the larva of a Mycetophilid fly), for the study of which he built a special underground chamber; this work, however, he never completed to his satisfaction and it remains unpublished.

After about three years at Christchurch, during which he revised the New Zealand Mycetophilidae in conjunction with me, and the Acalyptrates in collaboration with Malloch, besides studying the Simuliidae and other groups himself, Tonnoir returned to the Cawthron Institute in 1927 as 'Field Entomologist,' and assisted Tillyard in the production of his 'Insects of Australia and New Zealand.'

In 1928 Tillyard was appointed chief entomologist to the Commonwealth Government, and Tonnoir (with his young family) followed him as his assistant in the division of economic entomology at Canberra. From this time onwards administrative duties and laboratory and field work in connection with various pests claimed an increasing proportion of his time. He was put in charge of grasshopper work, and also dealt with other pests of grasses. This entailed a good deal of travelling, and for the latter part of 1932 he re-visited New Zealand to study, at the Cawthron Institute the life history of a Tachinid parasite of grass grubs. In 1930 he spent a long vacation in Tahiti, where he studied the early stages of Simuliidae. His only return visit to Europe was in 1935, when he spent a short time in England and attended the International Congress of Entomology at Madrid.

Although Tonnoir sometimes complained—especially after the death of Tillyard, his closest friend, early in 1937—that his arduous official duties left

him all too little time for purely scientific work, he was nevertheless able to accomplish a great deal. Besides publishing important work on Indian Blepharoceridae, he maintained and developed his interest in Psychodidae, and undertook reports on American, African and other collections for the British Museum. He collected and studied the antipodal Psychodidae intensively, but refrained from publishing incomplete results: he always regarded publication of 'loose descriptions of new species' as futile. The problems of parthenogenesis and life-cycle in *Psychoda* attracted his attention and he was excited by a new species of this genus, perhaps a mutant of *Ps. alternata*, which appeared last year in his laboratory, breeding in a sink-trap. He found this insect to have a remarkably short life-cycle, and in one of his last letters wrote: 'I have now brought down the life-cycle of the new *Psychoda* to five days—stupendous!'

In 1930 the British Museum came into possession of the late Rev. A. E. Eaton's collection of Psychodidae and I suggested to Tonnoir that he should examine this collection and edit Eaton's MS. notes. He readily accepted this suggestion, which, after some investigation and discussion, led to the further proposal that he should collaborate with Feuerborn in writing the section on Psychodidae in 'Die Fliegen der palaearktischen Region,' Tonnoir dealing with the adults and Feuerborn the larvae, an arrangement which Lindner cordially agreed to on my suggestion in 1932. Unfortunately shortly after this Feuerborn became deeply involved in politics and the joint work was delayed; it was not until 1939 that Tonnoir received Feuerborn's large collection for study, and not until August last were the two authors able to begin serious discussion as to the amalgamation of their work. It is greatly to be hoped that they were sufficiently advanced to ensure publication as soon as conditions allow.

Meanwhile a number of undescribed species of Psychodidae had turned up in England, in addition to those represented in Eaton's collection, and as the delay in the completion of the work for Lindner lengthened, I asked Tonnoir if he would not describe the British species first in order that their names might be inserted in the new check-list of British Diptera (also long promised and long delayed). Although Tonnoir did not care for this idea—preferring, as always, a more complete monograph—he eventually agreed, writing in March, 1938, with characteristic generosity, 'You have been so good to me that I cannot very well refuse you anything.' The result is the Synopsis of British Psychodidae now about to appear in the Transactions of the Society for British Entomology, which should prove a great boon to British students of the family pending the appearance of the larger work.

Even while Tonnoir was in New Zealand, signs of his 'restlessness' may be detected in minor lapses in his published papers, as when he wrote 'Knab' for 'Dyar and Shannon,' or 'Cockerell' for 'Coquillett.' This tendency was perhaps increasing lately, as he himself admitted ('I write black when I mean white'); and though he wrote in 1919 'I understand perfectly your language,' his writing of English remained amusingly short of perfection. Such lapses, however, may be passed over as the prerogative of genius. A lively zest ran through all his writing, and his work will live for its insight and essential accuracy as well as for its combined breadth and grasp of detail.

Miss P. Tillyard writes: 'Tonnoir was extremely keen on music, and was the leading spirit in a small group of enthusiasts who used to meet frequently for discussion and to whom he lectured.'

André Léon Tonnoir was born at Brussels in April, 1885, and was the son of a Belgian business man. He married Miss Zita Bisley, of Nelson, in 1923; she and their three children survive him.—F. W. EDWARDS.

CONCERNING THE THREE SPECIES *HALIPLUS LINEOLATUS* MANNERH., *H. WEHNCKEI* GERH. AND *H. HEYDENI* WEHNCKE (COL., HYDRADEPHAGA), WITH SOME REMARKS UPON THE ORIENTATION OF THE MALE SEXUAL ARMATURE IN THE HYDRADEPHAGA.

A REPLY TO DR. G. FALKENSTRÖM.

BY FRANK BALFOUR-BROWNE, M.A. (OXON. ET CANTAB.), F.R.S.E.,

F.Z.S., F.R.E.S., F.R.M.S.

(formerly Professor of Entomology at the Imperial College of Science, London).

In a paper published in 1939 (1)<sup>1</sup> Falkenström has endeavoured to support Zimmermann's view that *H. lineolatus* Mannerheim is the same species as *H. wehnckei* Gerhardt, but as I shall be able to show that Zimmermann never recognised Mannerheim's species, even if he saw it, the whole series of assumptions made by Falkenström are worthless and have only contributed confusion to the subject. In a footnote, p. 29, of his monograph (2), Zimmermann stated that 'the beetles employed by Mannerheim for the description of his *lineolatus*' are one specimen in the Bavarian State collection at Munich and three others in Thomson's collection in the Berlin Zoological Museum. This appears to be based first upon a statement by Schaum (3) that the specimen now in the Munich Museum is an 'original example' of *lineolatus* Mannerh., a statement which Zimmermann interpreted as meaning a *type*, and secondly upon three specimens of *ruficollis* Deg. in the Thomson collection which were labelled *lineolatus*. Zimmermann gives no grounds for his view that these were Mannerheim's material, but places his faith in the one specimen in the Munich Museum, which, in my opinion, is a male *immaculatus* from which the aedeagus has disappeared, although Zimmermann apparently regarded it as *wehnckei* (his *lineolatus*) and Falkenström endeavours to show that he was right. I have again looked at my notes on this specimen and must still maintain that it is *immaculatus*. But, whereas the identification of it as one or other of these species makes no difference to my argument, it makes all the difference to that of Falkenström, because, if the specimen is *immaculatus*, Falkenström's argument based upon it would be worthless.

To deal first with Zimmermann. He appears to have been very casual in his choice of material upon which to base his statements. He did not trouble to obtain examples of *nomax* or *browneanus* from me or Sharp, but got *nomax* from v. Sydow of Hamburg.

<sup>1</sup> The numbers in brackets refer to the bibliography at the end of the paper.

We could also have supplied him with Edwards' *wehnckei*, which, without any doubt, is Gerhardt's species. When he first placed his *lineolatus* and *transversus* as separate species (4) he was apparently working with material which he had not taken the trouble to identify correctly, as he entered into details with regard to the differences between them. Thus with reference to *transversus*, among other things he pointed out: 1, the very long swimming hairs on the tibiae and tarsi; 2, the slimmer pronotum with a more markedly narrow front; 3, the longer, curved, sharply cut basal striae enclosing a transverse depression; 4, the micropunctuation of the female elytra restricted to a very small area on the posterior and exterior half, the punctuation being extremely fine. In 1924 he mentioned that he had seen the types of *transversus* and *lineolatus* and that they were identical, and he proceeded to explain away the differences he had previously noted.

With reference to the castrated *immaculatus* (or *wehnckei*) in the Munich Museum, Falkenström states that Zimmermann 'would not have formed such a positive opinion on the original specimen . . . if he had not seen its genitalia with his own eyes,' and yet, on the following page, he admits that Zimmermann identified the Berlin specimen of *transversus* 'only by its external characters.' Actually, however, the apex of the aedeagus of this specimen is visible and easily recognisable as that of *lineolatus* (*nomax*), but obviously neither of these authors observed this. Whether, since I saw the specimen, Falkenström has dissected it out, or how he came to the conclusion that the specimen is *nomax*, he does not mention. Remembering that Zimmermann compared the types of his *lineolatus* (*wehnckei*) and *transversus* and found that they were the same species is a sufficient indication of the quality of his work, upon which Falkenström relies. He even failed to observe the excised posterior margin<sup>2</sup> of the basal segment of the middle tarsus of the *transversus* type, in which it differs entirely from *wehnckei*. Finally with regard to Zimmermann, he does not seem to have known of the Helsingfors and Stockholm specimens of *lineolatus*, so that it seems possible that he never even saw the species. But there is even less excuse for Falkenström in adopting the synonymy of Zimmermann because he knew the specimens in the Mannerheim collection in the Helsingfors Museum, one of which is labelled 'Spec. Type No. 63,' for although he refers to these specimens he omits to mention that one of them is so labelled, and he identifies

<sup>2</sup> Falkenström takes me to task for calling this the 'posterior' margin instead of the 'underside.' If he can find any other posterior margin I am willing to adopt his nomenclature.

them as *nomax* assuming that they are not the true Mannerheim species.

Falkenström complains that Zimmermann did not state what material of *transversus* he had, although that author had called attention to the Berlin 'original' specimen. Again, he speculates as to how Zimmermann knew *nomax*, and says that he 'probably' recognised it because of newer material from north-west Germany, and he adds 'he seems never to have been in doubt as to its absolute independence.' Since he was comparing it with *wehnckei* this is scarcely to be wondered at. In referring to the *transversus* type specimen, Falkenström says: 'In bitter pessimism Thomson sold a so-called collection of type specimens of his beetles to Germany.' In a letter to me in October, 1935, he said: 'Thomson, some years before his death, sold a type collection of his beetles to Germany.' The 'so-called' appears to have been inserted in order to dissipate the value of the type specimen of *lineolatus*, which has turned out to be not *wehnckei* but *nomax*. An earlier sentence in the paper is to the same effect. He says: 'There is . . . no rule of nomenclature or precedent prescribing that the present appearance of type material should be recognised ground for the complete alteration of the purport and definition of a long known species.'

When Falkenström comes to a discussion on the females he does so as if the micropunctuation of each species was not only constant, but definitely characteristic. He says 'only *ruficollis*, *fluvialis*, *lineolatus* and *wehnckei* show a reduced punctuation on the apical half of the elytra, and it is strong and close in the first two forms and fine and sparse in the other two.' In all three species (his *lineolatus* and *wehnckei* are *wehnckei*) the females vary greatly in the amount and density and strength of the micropunctuation. For instance, in this country *ruficollis* females are mostly punctured all over the elytra, but we do find examples with only the apical half covered, perhaps more commonly in the eastern counties, and these females resemble our usual form of *wehnckei*. Although, perhaps, *wehnckei* is never completely covered, the micropunctuation varies in extent, strength and density, so that it is not possible to separate *ruficollis* and *wehnckei* females on this character. Similarly *fluvialis* females in this country vary so that in some specimens the punctuation is visible to the base while in others it does not extend much beyond the apical half. Thus the extent and character of the micropunctuation varies with locality, not only in the British Isles but elsewhere, as Falkenström informed me that he sometimes finds females of *ruficollis* with com-



pletely micropunctured elytra, but he does not mention this because it would affect his diagnosis of a specimen which both Zimmermann and I recognised as *ruficollis*. We saw three specimens from the Thomson collection in Berlin which were labelled '*lineolatus*,' one male and two females. We independently identified these as *ruficollis*. Falkenström now states that Berlin has only two of these and that, on enquiry, he was informed that I had only returned two. I have looked up my notes and have traced a copy of a letter to Dr. Kuntzen, sent the day I returned the box of specimens to him, in which I specifically call his attention to those three insects as being *ruficollis* and not *lineolatus*. Falkenström says that the remaining female is *wehnckei*, and on referring to my notes I find that I observed the 'straight pronotal striae' in one or both females (my note on the second female merely states that it is exactly like the first). This is a character of *wehnckei* rather than of *ruficollis*, although it is by no means determinate by itself, but in any case the specimen seen by Falkenström is not *lineolatus*, and although, as Falkenström says, 'the German Zoological Museum was enriched' by his examination of this insect, it is wrongly named '*lineolatus*.' I appear to have omitted to make a note of the label attached to the pin of this specimen, which reads, according to Falkenström, '*lineolatus* Mnhm. Hlm. typ. dixit Fahraeus,' which would normally mean that this specimen was what Fahraeus took as his idea of *lineolatus*. But Falkenström says, 'Presumably Fahraeus received the specimen direct from Mannerheim,' and, although he is puzzled as to how it got into Thomson's collection, he treats it as if it were definitely a type specimen. There is not a particle of evidence that Mannerheim ever saw the insect, but, according to Falkenström, Fahraeus was 'a colleague and contemporary of Count Mannerheim, whose witness to the genuineness of the female type must be unconditionally recognised.' Pure assumption!

But why has Falkenström paid so much attention to the label on this Thomson specimen and yet omitted to mention the type label on the Helsingfors one? He does refer to 'the only two specimens in Mannerheim's collection in the Zoological Museum in Helsingfors which quite certainly originate from Mannerheim,' and later he even mentions that one of these bears a number 63, but it would of course have been difficult to explain away the words 'Spec. type.' Similarly he admits the existence of 'four probably authentic Mannerheim *lineolatus* specimens' in the Stockholm Museum, but these, as well as the two specimens at Helsingfors,

are all *nomax*. In order to evade the point he says that this fact 'does not prove that all Mannerheim's examples which served as samples in the year 1844 belong to the latter species' (*nomax*). It will surely occur to any ordinary entomologist that if six specimens (admittedly authentic Mannerheim specimens) are all the same species, one of them being labelled 'Spec. type No. 63,' all of which are in collections known to have been associated with Mannerheim, they are more likely to be the real species than odd specimens in other collections. The author would surely keep his type in his own collection?

Zimmermann finally came to the conclusion that *transversus* Thoms. was a synonym of *wehnckei* Gerh., while both Falkenström and I, having seen the type specimen, as already mentioned, recognised it as *nomax*, but in this paper Falkenström springs another surprise, as he sets up *transversus* as the correct name for *heydeni* Wehncke. He argues that Thomson named *transversus* in 1870—actually the date should be 1869—and later, 1884, named a species '*foveostriatus*.' But he now states that the original type of *transversus* is in the Zoological Museum at Lund and that it is *heydeni*. It is obvious that there cannot be two types of a species, but Falkenström gives no reason for his decision that the Lund specimen is the original type. Of course it is much more convenient from the point of view he has taken up that the Berlin specimen should be degraded, but as Thomson sold his type collection to Berlin, the evidence is in favour of the genuineness of the Berlin specimen.

Falkenström does not make it clear where he found the type of *foveostriatus*, but he certainly suggests that the Lund specimen is labelled '*transversus*,' although he does not actually say so. He attempts to justify his view by saying that 'the *transversus* specimen in Berlin . . . corresponds neither with Thomson's description of *transversus* nor with that of *foveostriatus*.' I have examined the original description of *transversus* and I cannot find anything to suggest that it is not applicable to the Berlin specimen. Falkenström says of the Berlin specimen, 'It shows . . . no sign of enlarged punctures at the bases of elytral striae 3-5 nor has it the deeply impressed striae, but only simple rows of blackish punctures in lines.' The description merely says that the elytral striae are punctate with black lines, the interstrial spaces with one or more punctures. It is a vague description which might apply to several species, but there is nothing in it which excludes the Berlin specimen, especially in a genus in which the species show such variations

in the extent and depth of the punctures, but I mention it because it shows how Falkenström endeavours to support his theories.

In the absence of any evidence to the contrary, I have not the slightest doubt but that the correct synonymy is:—

*Haliphus lineolatus* Mannerheim, 1844.

= *transversus* Thomson, 1869.

= *nomax* B.-B., 1911.

= *browneanus* Sharp, 1913.

*Haliphus wehnckeii* Gerhardt, 1877.

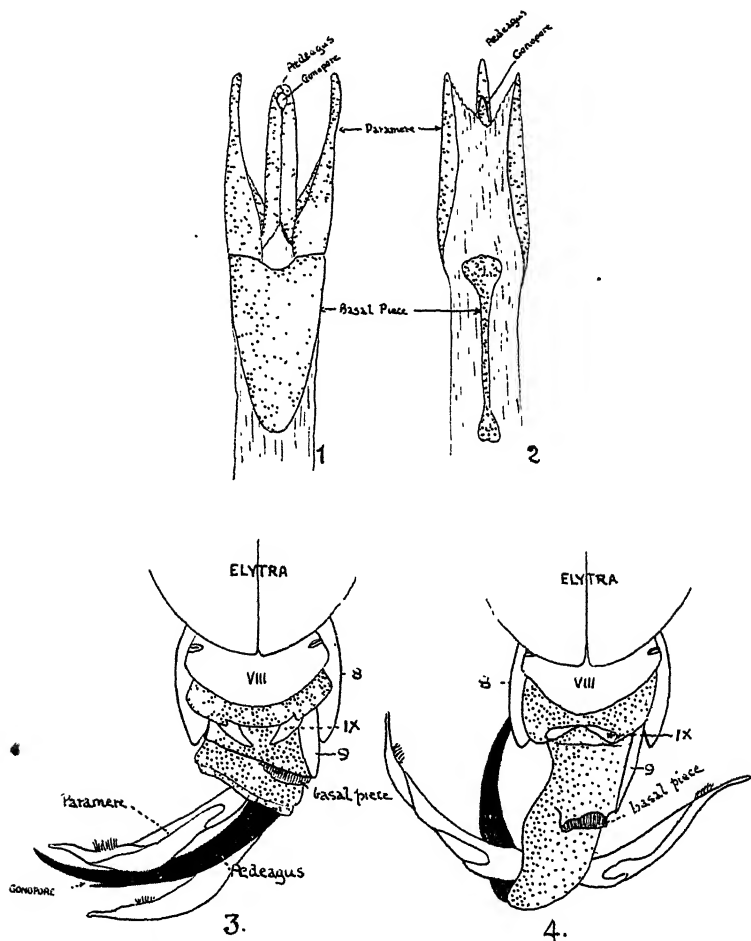
= *wehnckeii* Edwards, 1911.

*Haliphus heydeni* Wehncke, 1875.

= *foveostriatus* Thomson, 1884, teste Falkenström.

Falkenström concludes his paper by a direct attack upon my knowledge of morphology, as he refers to my 'inexplicable misunderstanding' of the orientation of the male sexual armature. In the Hydrophilids, where the aedeagophore is flattened dorso-ventrally, it lies flat within the body when at rest. While it is being extruded it turns over with a corkscrew movement, and at the same time the apex turns round until it points forward. When this movement is completed the aedeagus and parameres have rotated on their base through 180 degrees, so that the dorsal surface is still dorsal when the aedeagus enters the vulva. This movement was recorded in the case of *Hydrophilus piceus* by Donisthorpe (1900, *Ent. Rec.*, **12**: 291) and later by me in the case of *Hydrobius fuscipes* (1909, *Trans. R. Soc. Edin.*, **47**: 321). Where the curved aedeagus lies on its side when at rest, as in the Hydradephaga, I know of only two methods of determining the orientation, although there appears to be a third. Zimmermann recognised the concave side of the aedeagus as the dorsal side, but, according to Falkenström, he was 'quite wrong' because 'he designated the parameres from the root,' a method unknown to me. An examination of the aedeagus of an Hydrophilid, where there can be no question as to which is the dorsal side, shows that the opening of the ejaculatory duct, the 'gonopore,' is always on the ventral side below the apex. In the Hydradephaga, the gonopore is on the convex side. In the Hydrophilidae, the parameres are attached to a broad plate, the basal piece (fig. 1) which lies on the ventral side of the aedeagophore. In the Hydradephaga, this basal piece is reduced to a long narrow strut, broadening at each end and embedded in the tissues, but so reduced that it no longer supports the parameres (fig. 2). In figures 3 and 4 the apex of the strut can be seen, and in fig. 4 it has reached a dorsal position, indicating that the ventral side of the aedeagophore is uppermost. By following

along the curved surface it will be seen that the convex side of the aedeagus is the ventral side. Here, therefore, the aedeagophore has rotated through 90 degrees. Falkenström has been deceived



FIGS. 1—2. Diagrammatic drawings of the ventral side of the aedeagus of an Hydrophilid, showing the large basal piece supporting the parameres and of a Dytiscid where the basal piece is reduced to a narrow strut. Chitinous parts dotted.

FIGS. 3—4. Diagrammatic representation sketched from an *Ilybius ater*, showing the protrusion of the aedeagophore preliminary to copulation. Fig. 4 shows the aedeagus about to enter the vulva and the basal piece, ventral in fig. 2, has become dorsal by the rotation of the aedeagophore. VIII and 8 represent the eighth segment, tergum and sternum. IX represents the ninth tergum and 9 the 'oval plate,' part of the ninth sternum. Membranous parts dotted.

by the appearance of the connection which, to one who has not studied the structures concerned, suggests that the convex side is the dorsal side. Lastly, I know of no insect in which the aedeagus enters the vulva upside down. Falkenström concludes his remarks on this subject: 'Consequently I hope that the absurd naming of the parameres of the Haliplides which the English have inaugurated will at last be corrected. The systematology of beetles must be pursued as Zoology'—and perhaps I might add, by Zoologists.

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Hook Place, Burgess Hill, Sussex.

April 7th, 1940.

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*Hydroecia paludis* Tutt (*Lep.*, *Agrotidae*) in the Isle of South Uist.—Quite recently (1940, *Entomologist*, **73**: 7) were recorded the final results of examining my preparations of the genitalia of the genus *Hydroecia* as represented in the Hebrides. At that time I was unable to report *H. paludis* from the Outer Isles. However, I had two *Hydroecia* males, captured on ragwort near Loch Eynort, South Uist, which had not been subjected to study. Mr. P. J. Deoras, M.Sc., very kindly volunteered to prepare these. In accepting his kind offer, I felt sure that little would result, for I imagined both to be representatives of the ubiquitous *H. lucens* Frey. I was surprised and pleased to find that, although one was nothing but *H. lucens*, the other was a veritable *H. paludis*, and thus provided the first Outer Island record of the species.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne: April 25th, 1940.

*Lithostygnus serripennis* Broun (*Col.*, *Lathridiidae*) in Surrey.—On October 30th, 1939, whilst sieving a small box of sawdust and wood-shavings from my garden shed, I came across two specimens of this Lathridiid beetle, originally a native of New Zealand. It was accompanied by the following: *Ephistemus globulus* Payk. (1), *Mycetaea hirta* Marsh. (10), *Cartodere elongata* Curt. (2), *Corticaria crenicollis* Mann. (6), *Longitarsus luridus* Scop. (1). It is now thirteen years since *L. serripennis* was first taken in Surrey, by Mr. C. E. Stott at Reigate (*vide* 1928, *Ent. mon. Mag.*, **64**: 140). I am indebted to Rev. C. E. Tottenham for his kind assistance in identifying the species.—A. M. EASTON, Roadside Cottage, Lower Road, Great Bookham, Surrey: April 22nd, 1940.

[N.B.—Though originally assigned to the Colydiidae (Broun, 1886, *Man. N.Z. Col.*: 950), the genus *Lithostygnus* was subsequently (1914, *Bull. N.Z. Inst.*, No. 1: 185) correctly placed in the Lathridiidae.—K.G.B.]

THE OCCURRENCE OF BOTH *STAPHYLINUS CAESAREUS* CED. AND  
*S. PARUMTOMENTOSUS* STEIN (COL.) IN BRITAIN.

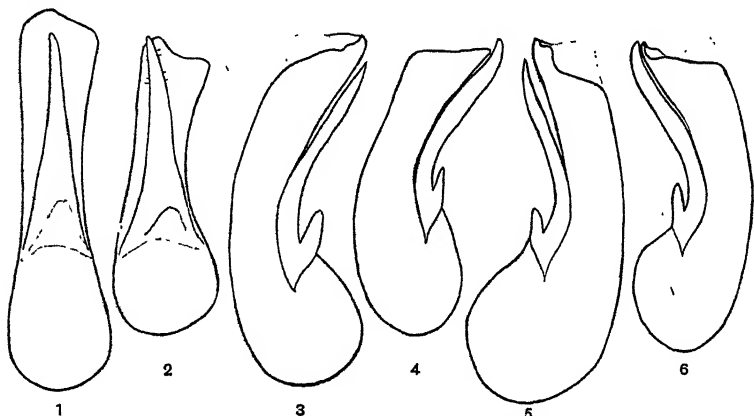
BY THE REV. C. E. TOTTENHAM, M.A., F.R.E.S.

Some time ago Mr. W. O. Steel expressed to me the opinion that both *Staphylinus caesareus* and *S. parumtomentosus* occurred in this country. Having occasion recently to determine some specimens of *Staphylinus* in the collection of Mr. R. W. Lloyd, I considered it advisable to go carefully into the matter, with the result that I can confirm Mr. Steel's opinion. *S. caesareus* Ced. has been in the lists of British Coleoptera for a great number of years. The description given by Fowler (1888, *Brit. Col.*, 2: 252) could apply equally to this species and to *S. parumtomentosus* Stein, which latter species was for some time regarded as a variety of *S. caesareus*. Müller (1926, *Boll. Soc. Ent. Ital.*, 58: 42; 1932, *ibid.*, 64: 77) has pointed out the specific distinctness of the two species. Donisthorpe (1930, *Ent. mon. Mag.*, 66: 95) mentions most of the differences and records *S. parumtomentosus* Stein as British. But he states: 'This species is the *S. caesareus* of British collections, the latter species not occurring in our country. The type of *caesareus* was described from a specimen captured in the neighbourhood of St. Petersburg.' It is strange that he should have made such a statement, since there are British specimens of *S. caesareus* in the collections of the British Museum. Perhaps it would not be out of place to appeal to authors to be a little more accurate in their statements in such matters. 'Does not occur' in many cases is an unwarranted statement; it is, in fact, a mis-statement for 'has not been recorded,' 'to my knowledge does not occur,' 'none of the specimens which I have examined are . . .' or some similar expression.

Mr. Donisthorpe does not mention the colour of the antennae, which in *caesareus* are entirely light, or feebly darkened apically, but in *parumtomentosus* they are distinctly dark on the apical segments.

Judging from the specimens which have come under my notice, I would say that *caesareus* is decidedly rare in this country; the only specimens of it which I have seen are in the British collection and in the Sharp collection at the British Museum, and come from the New Forest. *S. parumtomentosus*, on the other hand, I have seen from: New Forest and Ramsbury (Coll. R. W. Lloyd); Box Hill, Hampstead, Lee, Lelant (Power collection at British Museum); Dumfries, New Forest, Bishop's Wood (Sharp collection at British Museum); Killarney, Braunton and Hartlebury (my own collection).

My specimen from Hartlebury is a colour aberration, in which the patches of pubescence on the abdomen are brown instead of golden; I propose for it the name *brunneimaculatus* ab. nov. I captured it in grass tufts, 23.ii.1935.



FIGS. 1, 3, 5.—Aedeagus of *Staphylinus caesareus* Ced.

FIGS. 2, 4, 6.—Aedeagus of *Staphylinus parumtomentosus* Stein.

The differences in the form of the aedeagus of the two species can be seen from the accompanying figures. The principal differences are that in *S. caesareus* the aedeagus is longer, the apex of the median lobe is more oblique, the paramere is shorter than the median lobe, and is nearly straight; in *S. parumtomentosus*, on the other hand, the aedeagus is distinctly shorter, the apex of the median lobe is less oblique, the paramere is longer than the median lobe, and is strongly bent to the left.

I have assumed that Müller's determination of the two species in question is correct, not having been able to see the types myself.

c/o R. W. Lloyd, Esq.,

I, 5 & 6 Albany, Piccadilly, W.1.

April 13th, 1940.

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*Cryptoserphus longitarsis* Thoms. (Hym., Proctotrupidae) in Cumberland.—In his monograph of British Proctotrupinae (1938, *Trans. R. Ent. Soc. Lond.*, 87: 463) Nixon gives only two British localities for this species, Windsor Forest to Donisthorpe and Brockenhurst to himself. I caught a female while sweeping under and beating birches on the northern edge of Todhills Moss, Cumberland, 15th October, 1938. This is about five miles from the Scottish border, and it is interesting to be able to record it from so far north. My specimen is blackish, excepting the apical segments and ovipositor, which are yellowish-brown. Mr. Nixon's female was taken in June, but Mr. Donisthorpe's female occurred, like my own, in October. My specimen was kindly determined by Mr. G. E. J. Nixon.—JAS. MURRAY, 6 Burnside Road, Gretna, Dumfriesshire: April 27th, 1940.

## SOME NEW SPECIES OF CISIDAE (COL.) FROM AUSTRALIA.

BY K. G. BLAIR, D.SC., F.R.E.S.

The following species of Cisidae have long remained unnamed in the British Museum (Natural History); they were collected, unless otherwise stated, by the late Commander J. J. Walker when on H.M.S. 'Penguin,' and were presented by the Lords of the Admiralty to the National Collection.

***Xylographus bynoei* sp.n.**

Short, stout, piceous, sometimes broadly red on dorsum of elytra. Upper surface strongly, irregularly, not very closely punctate, each puncture giving rise to a long erect hair; at the sides the hairs are longer and turned upwards.

Head usually withdrawn beneath the hood of the pronotum; mandibles prominent, the left uppermost, with two large teeth apically, the upper edge broadly curved (♀). Antennae with third joint as long as second but much more slender, fourth and fifth successively shorter, sixth and seventh transverse, the three joints forming the club also transverse. Thorax completely margined, anterior margin very much finer than those of sides and base; all angles completely rounded. Elytra but little longer than together wide, base strongly margined, humeral angles rounded, the humeral callosity evident. Tibiae strongly flattened and expanded towards apex, closely denticulate round external angle, less closely on outer edge.

♂. Left mandible with strong, upwardly directed tooth on upper edge, a little larger than the two apical teeth; frons high, feebly convex, with scattered setigerous punctures; high up towards the vertex on each side is a large tubercle, each emitting a pencil of long hairs, the tips of which project beyond the rim of the thorax when the head is withdrawn. Length 2 mm., width 1½ mm.

NEW HOLLAND (Reg. No. 44.4), 3 ♂♂, 8 ♀♀.

The register gives the further information that they were collected by B. Bynoe, R.N., surgeon on H.M.S. 'Beagle,' on the north or north-west coasts of Australia, but nearer locality is not ascertainable. Other species of the same collection were described by Adam White in J. L. Stokes' 'Discoveries in Australia . . . surveyed during the voyage of H.M.S. "Beagle" in 1837-43,' Vol. I, Appendix (1846).

The genus is widely distributed, being known from Europe, Africa, Madagascar, Ceylon, Amur, Central and South America, but has not hitherto been recorded from Australasia.

The new species resembles the European *X. bostrichoides* Dufour more than any other species known to me, but is relatively stouter, more closely punctate with the interstices less nitid, the tooth on the upper edge of the left mandible of male larger and more distant from the others.



## KEY TO AUSTRALIAN SPECIES OF CIS.

1. ♂ ♂ with cephalic armature ..... 2
- 2 ♀ or ♂ ♂ without cephalic armature ..... 12
2. Clypeus with median erect vertical plate; thorax alutaceous between punctures ..... 3
- Front of head with paired prominences ..... 6
3. Elytral setae uniform, short and irregular; clypeal plate broader than corresponding projection of thorax ..... *bilamellatus* Fowl.
- Elytra with ten regular rows of longer setae, with shorter between; clypeal plate narrower than that of thorax ..... 4
4. Front of thorax strongly raised, colour dark ..... 5
- Front of thorax scarcely raised, colour yellowish ..... *clarki* var. *laetior* n.
5. Size small (1 mm.) ..... *setiferus* Blbn.
- Size larger (1½ mm.), large tubercle in middle of first ventral segment.  
..... *clarki* sp.n.
6. An erect, flattened horn on each side in front of eye; first ventral segment of abdomen with large round tubercle. Thorax simply densely punctate, intervals shining, elytra with double puncturation and irregular short pubescence ..... *cervus* sp.n.
- Clypeal prominences shorter, not erect ..... 7
7. Front of head with four teeth, two sharp clypeal and two large genal; front of thorax also bidentate; thorax and elytra simply, moderately densely punctate with long, erect hairs; colour yellow ..... *armiger* sp.n.
- Front of head with two teeth, sometimes subobsolete ..... 8
8. Front of head truncate, extreme corners slightly raised, frons shallowly excavate; elytra seriate-punctate, intervals each with row of long hairs ..... *cavifrons* sp.n.
- Clypeal projections present ..... 9
9. Clypeal projections nearer to one another than to eye ..... *walkeri* sp.n.
- Clypeal projections at least as far apart as from eye; genae also involved in elevation ..... 10
10. Front of thorax strongly raised (New Guinea) ..... *laminicollis* sp.n.
- Front of thorax not or scarcely raised (Australia) ..... 11
11. Sides of thorax evenly rounded, all angles obsolete ..... *victoriensis* Blbn.
- Sides of thorax more rounded near base than towards apex; anterior angles blunt but evident ..... *tasmanicus* sp.n.
12. Upper side glabrous or with setae short and inconspicuous ..... 13
- Upper side obviously setose ..... 16
13. Puncturation fine and sparse ..... 14
- Punctures strong, as broad as or broader than intervals ..... 15
14. Unicolorous brown; interstices between punctures shining, angles of thorax obtuse but distinct; elytra almost impunctate ..... *adelaidae* Blbn.
- Reddish-testaceous with basal half of elytra fuscous; interstices of thorax alutaceous; angles rounded ..... *sellatus* sp.n.
15. Colour brown; thorax widest in middle, posterior angles rounded.  
..... *aequalis* Blbn.
- Colour yellowish-testaceous; thorax widest near front, posterior angles obtuse ..... *leanus* Blbn.
16. Elytral puncturation simple, each puncture with an erect seta ..... 17
- Elytral puncturation double, the larger punctures not setigerous ..... 19
17. Size larger (2 mm.), colour yellow, setae long ..... *armiger* sp.n.

- Size smaller (1 mm.), setae short ..... 18
18. More elongate, elytra twice as long as thorax, colour dark (E. Australia)  
*victoriensis* Blbn.
- Form shorter, elytra about one and a half times as long as thorax, colour  
 testaceous (New Guinea) ..... *laminicollis* sp.n.
19. Setae longer, more or less distinctly seriate ..... 20
- Setae shorter, not seriate ..... 24
20. Form elongate, rather depressed; elytra with regular series of large punctures, intervals each with a series of erect hairs; colour yellow.  
 ..... *cavifrons* sp.n.
- Form shorter, more convex; large punctures not regularly seriate, though  
 setae tend to form ten rows ..... 21
21. Length over 2 mm., rows of setae irregular and confused towards base.  
 ..... *australis* Blbn.
- Length less than 2 mm., rows of setae more regular ..... 22
22. Colour dark ..... 23
- Colour yellowish ..... *clarki* var. *laetior* n.
23. Size larger (1½ mm.), setae of thorax much shorter than those of elytra.  
 ..... *clarki* sp.n.
- Size smaller (1 mm.), setae of thorax almost as long as those of elytra.  
 ..... *setiferus* Blbn.
24. Punctures of thorax dense, intervals less than their width, smooth.  
 ..... *cervus* sp.n.
- Puncturation of thorax sparser, intervals alutaceous ..... 25
25. Lateral margins of thorax concealed from above ..... *bilamellatus* Fowl.
- Lateral margins of thorax visible from above ..... *tasmanicus* sp.n.

### *Cis sellatus* sp.n.

Reddish testaceous, with the basal half of the elytra blackish, apparently glabrous.

Head deflexed, convex, anterior margin upturned except in middle. Thorax with sides rounded, concealed from above except near base by the convexity of the sides, anterior angles scarcely marked; disc finely, not closely, punctate, with interstices alutaceous. Elytra yet more finely and sparsely punctate, more shining than thorax. Length 1¼ mm.

N.W. AUSTRALIA: Adelaide R., sex indeterminate, probably ♂ (J. J. Walker, No. 5029). Very distinct in colour from any other Australian species.

### *Cis clarki* sp.n.

Fuscous, clothed with conspicuous shining setae.

Head deflexed, frons flattened. Thorax transverse, sides rounded, concealed from above, anterior angles obtuse; disc moderately strongly but not closely punctate, not quite so closely as in *C. bilamellatus* Fowl., alutaceous between punctures, a narrow median line free of punctures in basal half; pubescence rather short, inclined in various directions. Elytra nitid, with double puncturation, i.e. large, shallow, round punctures irregularly dispersed, with fine setigerous punctures between; setae twice as long as those of thorax, arranged in ten fairly regular rows, between each of which is a row of setae only half as

long. Tibiae slightly expanded towards apex, anterior pair sharply rectangular at apex.

♂. Clypeus with an elevated plate feebly emarginate at top; prothorax also laminately produced at apex, but plate less elevated, wider and more deeply emarginate at apex than that of clypeus. First ventral segment of abdomen with a large, shallow, ringlike median tubercle. Length  $1\frac{1}{2}$  to 2 mm.

W. AUSTRALIA: Swan R., type pair marked 'in cop.,' also 4 ♂♂ and 4 ♀♀ (*J. Clark*). S.W. AUSTRALIA: Albany, 1 ex., iv.1891 (*J. J. Walker*, No. 4187); 3 exs., King George's Sound (*Mr. Brewer*).

Exhibits considerable variation in size and colour, pale specimens being probably immature. The armature of the male resembles that of *C. bilamellatus* Fowl. (= *munitus* Blbn.), but in the latter the cephalic plate is broader than the thoracic, the punctures of the thorax closer and the elytral setae shorter, more flattened and irregularly dispersed.

var. *laetior* n.

Smaller than the above and yellowish in colour, with the male characters similar but more feebly developed. Length  $1\frac{1}{2}$  mm.

W. AUSTRALIA: Swan R. (*J. Clark*), 3 ♂♂, 3 ♀♀, mounted on the same card with normal examples.

*Cis walkeri* sp.n.

Very like a small specimen of *C. clarki*, but with different male characters.

♂. Clypeus up-turned, with a blunt tooth on each side of the middle, these teeth nearer to one another than to the eyes, the gena between clypeus and eye rounded but not projecting. A similar ventral tubercle appears to be present. Length  $1\frac{1}{2}$  mm.

TASMANIA: Hobart, 1 ♂, xii.1890—iii.1891 (*J. J. Walker*, No. 2553).

*Cis armiger* sp.n.

Stout, parallel, yellow, moderately densely clothed with very long erect hairs.

♂. Head deflexed; frons concave, with a low elevated area behind clypeus, front margin raised, with four sharp teeth, two on clypeus and one on each side, larger and more prominent, on the gena. Thorax transverse, fully as wide as elytra, the anterior margin produced in a broad lamella forming a sharp tooth on each side above the corresponding genal tooth; behind the lamella is a shallow depression; disc moderately densely and deeply punctate, each puncture with a long, erect seta; interstices rather narrower than the diameter of a puncture. Elytra similarly but rather less closely punctate and pubescent. Anterior tibiae produced externally at apex into a sharp curved tooth. First ventral segment of abdomen with a small tubercle. Length 2 mm.

N.W. AUSTRALIA: Port Darwin, 2 ♂♂ (*J. J. Walker*, No. 4720).

**Cis cervus** sp.n.

Brownish testaceous, clothed with rather short stout reddish hairs.

♂. Front of head on each side drawn up into a flattened horn. Thorax transverse, with each side of the disc separately convex; sides completely visible from above; anterior angles obtuse, posterior rounded, base bisinuate; disc shining, moderately densely and strongly punctate, punctures separated by a distance about equal to their own diameters. Elytra with double puncturation, large, round, shallow punctures separated by about four times their diameters, interstices with fine setigerous punctures; setae stout, about four times as long as thick, sloping obliquely backwards and outwards, without serial arrangement. First ventral segment of abdomen with large, ringlike tubercle rather behind middle. Anterior tibiae expanded towards apex, external angle rounded. Length 2 mm.

TASMANIA: Hobart, 1 ♂, xii.1890-iii.1891 (*J. J. Walker*, No. 2554); Franklin, 1 ♂, Feb. 1891 (*J. J. Walker*, No. 3411).

The cephalic armature resembles that of *C. compressicornis* Fairm. from Fiji, but the latter is larger, glabrous and finely and sparsely punctate. It has 10-jointed antennae and is incorrectly placed in Dalla Torre's catalogue (Cioidae, in Junk, 1911, Col. Cat., pars. 30: 25) in *Cerucis* Mell.

**Cis tasmanicus** sp.n.

Ferrugineous, clothed with moderately short pubescence.

Head flat with anterior margin raised on each side, end of clypeus and gena raised together, with a small reentrant angle at end of suture. Thorax transverse, side margins gently rounded, entirely visible from above, posterior angles rounded, anterior slightly prominent; disc rather finely, not closely punctate, with interstices alutaceous. Elytra simply punctate, clothed with rather short stout hairs, not seriate. Sex indeterminate. Length 1½ mm.

TASMANIA: Franklin, 1 ex., xii.1890-iii.1891 (*J. J. Walker*, No. 2408).

This cannot, I think, be the female of *C. cervus* from the same locality, on account of the great difference in sculpture of both thorax and elytra.

**Cis cavifrons** sp.n.

Elongate, parallel, depressed on dorsum, flavo-testaceous, clothed with moderately long erect pubescence.

Head short, deflexed. Prothorax transverse, as wide as elytra, the sides almost straight in middle, posterior angles rounded, anterior hardly evident; disc moderately strongly punctate, punctures separated by about twice their diameters, interstices alutaceous. Elytra seriatly coarsely punctate, the intervals each with a series of fairly long hairs; humeral angle distinct, but obtuse.

♂. Frons shallowly concave between eyes, clypeal suture impressed, anterior margin almost straight across, with genae small, obtusely angular and slightly raised. Length about 1¼ mm.

N.W. AUSTRALIA: Adelaide R., 1 ♂, 1 ♀ (J. J. Walker, No. 5030).

Differs from all other Australian species in its elongate form and seriate-punctate elytra.

***Octotemnus walkeri* sp.n.**

Testaceous, subglabrous above, a few scattered setae at sides and near apex of elytra.

Head deflexed, clypeal suture arcuate, distinctly impressed; genae on either side slightly elevated; frons convex, finely and remotely punctate. Antennae short, third joint shorter than second, as long as fourth and fifth together, club as long as the rest, its first two joints transverse. Thorax nearly as long as wide, not strongly narrowed towards the front, all angles rounded, disc finely, rather remotely punctate, interstices alutaceous. Elytra nitid, rather more closely and unevenly punctate than thorax. Tibiae moderately flattened and expanded towards apex, spinose along external margins. Sex indeterminate. Length 1½ mm.

N.W. AUSTRALIA: Port Darwin, 3 sex indet., x.1891 (J. J. Walker, No. 5410).

Closely resembles the European *O. glabriculus* Gyll., but distinctly smaller and more parallel-sided, with the prosternum in front of the coxae shorter.

It may be noted that *O. opacus* Mellié, 1848, *Ann. Soc. Ent. Fr.*, (2) 6: 386, from Madeira, has been omitted from Dalla Torre's Catalogue (Cioidae, in Junk, 1911, Col. Cat., pars. 30: 26).

Department of Entomology,  
British Museum (Nat. Hist.),  
London, S.W.7.  
April 8th, 1940.

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*Trechus subnotatus* Dej. (Col., Carabidae) in Co. Dublin.—On April 27th, while examining a large and well established heap of cut grass and leaves at 'St. Annes,' Clontarf, Co. Dublin, I took two specimens of a *Trechus* that was new to me. I later ran it down in Fowler and Donisthorpe (1913, *Col. Brit. Isl.*, 6: 13) as *Trechus subnotatus* Dej., a species only once recorded from the British Isles, a single example being taken by Mr. P. de la Garde at Shaldon, near Teignmouth, Devon, in 1910 (cf. Newbery, 1910, *Ent. mon. Mug.*, 46: 131). Dr. K. G. Blair tells me that he knows of no other record. The heap in which the beetles were taken was composed of cut grass, oak, ash, beech, and *Ilex* leaves with some miscellaneous vegetable matter, and the specimens were secured by shaking and sifting the outer layers where these met the inner wet portion. To date I have obtained twenty specimens in company with various other common species. The *Trechus* is inclined to feign death for a short time and then make a dash for shelter, but the species is unmistakable on the cloth and looks rounder and flatter than *minutus* or the other small beetles seen in company with it. The lighter coloured legs are also very noticeable. — E. O'MAHONY, National Museum of Ireland, Kildare Street, Dublin: May 11th, 1940.

*A record of Melittobia acasta* Walk. (Hym., Eulophidae) from a Lepidopterous host.—During the autumn of 1939 four male and seven female *Melittobia acasta* Walk. were bred from a pupa of *Cydia pomonella* L. (Tortricina) found under the bark of an apple tree at Solliès Pont, Var, France. It was thought worth while to put on record such an unusual host for this species. From the same pupa also emerged three male and thirteen female *Dibrachys affinis* Masi (Hym., Pteromalidae).

*Melittobia acasta* Walk. has been recorded from a large number of hosts, most of which are either Hymenoptera or Tachinidae. Several Lepidoptera appear in the host list, but in these cases no details of the relationship of the parasite are stated. *Amphipyra pyramidea* L. (Noctuidae) is given in C. Morley and W. Rait Smith's list of hosts and parasites (1933, *Trans. Ent. Soc. Lond.*, 81: 133-83), but here *Melittobia* was probably hyperparasitic. *Melittobia* is given as a parasite of *Porthetria dispar* L. by H. Stadler (1933, *Ent. Anz.*, 13 (2-4): 27-30, 43-5, 58-60), but here again the Chalcidoid is probably hyperparasitic, since no distinction is made between true and hyperparasites in this list. E. K. Schedl (1936, *Der Schwammspinner (Porthetria dispar* L.) in Euro-asien, Afrika und Neuengland, *Monogr. angew. Ent.*, No. 12: 1-242) gives the same host, but he is merely quoting Stadler. F. Picard (1922, *Bull. Soc. Ent. France*, 19: 301-4) has had *Melittobia* attacking pupae of *Pieris brassicae* L. under laboratory conditions, but no progeny was reared.

W. R. Thompson and H. L. Parker (1927, *Parasitology*, 19: 1-34), experimenting on host selection by this species, come to the conclusion that a suitable host must conform with the following conditions:—(1) It must be at least twice the size of the parasite and usually much larger than it. (2) It must be surrounded by an envelope of some sort which may be hard or soft provided that there is a space between the body of the host and the envelope. Hosts with a hard cuticula firmly attached to the hypodermis are in general unacceptable. (3) In nature, the most favoured hosts appear to be thin-skinned larvae or pupae surrounded by a protective envelope of some sort, the eggs being deposited upon the body of the victim, either through the envelope or directly upon it, after the parasite has made its way into the interior of the envelope.' These conditions would rule out Lepidopterous pupae as hosts, and this record of *Melittobia* from a pupa of *Cydia pomonella* is interesting in this connection. It would seem that the *Cydia* pupa was first attacked by *Dibrachys*, the larvae of which started their development. This broke down the host tissue, and created air spaces within the pupal case, thus rendering the pupa a suitable host for *Melittobia*, which then attacked it.

My thanks are due to Dr. Ch. Ferrière for identification of the species.—F. J. SIMMONDS, Imperial Institute of Entomology, Farnham Royal, Bucks: March 20th, 1940.

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NOTES ON THE ETHIOPIAN ASILIDAE (DIPT.)  
*BICTRIA (PROMACHUS) NEGLIGENS* ADAMS AND *B. (P.) GUINEENSIS*  
 WIED., AND ON A NEW SPECIES.

BY B. M. HOBBY, M.A., D.PHIL., F.R.E.S.

These notes are the outcome of an attempt to identify certain Asilidae kindly sent to me by Mr. A. Cuthbertson, of the Department of Agriculture, Salisbury, S. Rhodesia. Owing to the present international situation it is manifestly impossible to verify my con-

clusions by obtaining on loan the types of the species discussed below. The manuscript has, however, been read by Mr. H. Oldroyd, who, in the course of checking my observations with the material in the British Museum, first noted that a West African species (which I here identify with *Bactria* (*Promachus*) *guineensis* Wied.) closely resembled one found in Rhodesia. To him I am further indebted for records, the loan of material and for supplying transcripts of several descriptions not available to me at Oxford.

In the list of specimens noted below the abbreviations B.M., D.A. and H.D. refer respectively to material belonging to the British Museum (Nat. Hist.); Department of Agriculture, S. Rhodesia; and the Hope Department, University Museum, Oxford.

*Bactria* (*Promachus*) *negligens* Adams.

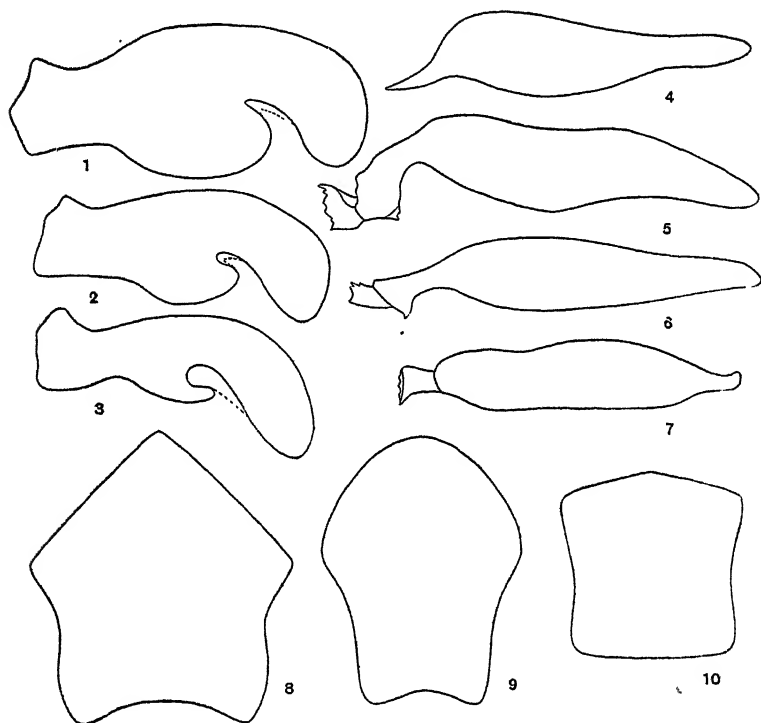
1905, *Kansas Univ. Sci. Bull.*, 3: 154.

The two sexes described under the name *Promachus negligens* Adams actually represent two species. One of these has a row of bristles on the upper part of the mesopleura, antennae chiefly black, palpi with both black and yellowish bristles, occiput with yellowish-white bristles, pronotum usually with yellowish-white bristles (sometimes with black ones), wings with a faint grey streak in first submarginal cell, upper forceps of male with smaller inner lobe (fig. 3), eighth abdominal sternite of male scarcely produced (fig. 10), aedeagus with axis straight (fig. 7). The original description makes it clear that this species is represented by the female in Adams' collection; it is also the one which Miss G. Ricardo had before her when constructing her 'Table of *Promachus* species from Central and East Africa' (1920, *Ann. Mag. Nat. Hist.* (9) 5: 178-9), as is evident from her arrangement of the material at the British Museum (Nat. Hist.) (*teste* H. Oldroyd, *in litt.*) and from her statement (*op. cit.*, p. 184) that the antennae are entirely black, although this character is not constant.\* Since Miss Ricardo's papers and the British Museum collections have been so widely used for identifying Asilidae, it is here deemed advisable to adopt her interpretation of the species and to restrict the name *negligens* to the species having the characters enumerated above, even although this action has the disadvantage of establishing a female lectotype.

*Localities* (additional to those recorded by Miss Ricardo): NYASALAND: Ngara, 1 ♀ sex (*F. L. Puxley*, B.M.), 21.x.1910, 1 ♀ (*J. E. S. Old*, B.M.); Zomba, no date, 11 ♂♂, 7 ♀♀ (*H. S. Stannus*, B.M.). S. RHODESIA: Gazaland, Umvumvumvu River, 24.x.1905, 2 ♂♂, 1 ♀ (*G. A. K. Marshall*, H.D.); Salisbury, 5,000 ft., x.1899, 2 ♂♂, 2 ♀♀; ix.1900, 1 ♂, 1 ♀; 6.x.1901, 1 ♀ (*G. A. K.*

\* In Ricardo's key both halves of couplet six (antennae usually partly red; antennae wholly blackish) lead to couplet eleven, and hence to *negligens*.

Marshall, H.D.); Urungwe, Gota Gota, 25.viii.-13.x.1938, 2 ♂♂, 3 ♀♀ (W. L. Williams, D.A.), 1.x.1938, 1 ♀ (J. G. Clarkson, D.A.); Zambesi River, Victoria Falls, rain forest, 3,000 ft., 19.x.1905, 1 ♂, 1 ♀ (G. B. Longstaff, H.D.). N. RHODESIA: Luena District, Upper Lukulu River, 29.ix.1904, 1 ♀ (R. L. Harger, B.M.); Mazabuka, 3,000 ft., 2.x.1929, 1 ♂, 1 ♀ (W. Allen, B.M., det. E. O. Engel). TANGANYIKA: Nr. Buyombe, 50 miles south of L. Victoria, 11.viii.1916, 1 ♀ (G. D. H. Carpenter, H.D.); Tangan-Nyassa Plateau, Fwambo, x.1892-ii.1893, 1 ♀ (W. H. Nutt, B.M.).



Male terminalia in outline, bristles omitted.

- FIGS. 1-3.—Left upper forceps viewed from above; 1, *Bactria snowi* sp.n.; 2, *B. guineensis* Wied.; 3, *B. negligens* Adams.  
 „ 4-7.—Aedeagus viewed from side; 4, *B. ?guineensis*; 5, *B. snowi*; 6, *B. guineensis*; 7, *B. negligens*.  
 „ 8-9.—Eighth sternite; 8, *B. snowi*; 9, *B. guineensis*; 10, *B. negligens*.

### ***Bactria (Promachus) snowi* sp.n.**

*Promachus negligens* Adams (*partim*), 1905, *Kansas Univ. Sci. Bull.*, 3: 154.

The second species is here named after Mr. F. L. Snow, who collected the material studied by Adams. It superficially resembles *B. negligens*, but may be distinguished by the absence of bristles on the mesopleura, basal segments of antennae distinctly reddish at least beneath, palpi with yellowish-white bristles, occiput with



both black and yellowish bristles, pronotum usually with black bristles, wings without grey streak in first submarginal cell, upper forceps of male with larger inner lobe (fig. 1), eighth abdominal sternite of male strongly produced (fig. 8), aedeagus curved downwards distally (fig. 5).

*Paratypes* (except where otherwise indicated): KENYA. Rabai, 1-11.1929 (*van Someren*, B.M.). NYASLAND: Bua River, 8-10.xii.1910, 2 ♂♂ (*J. E. S. Old*, B.M.); Marimba, xi-xii.1910, 1 ♀ (*J. E. S. Old*, B.M.); Mt. Mlanje, 30.x.-20.xii.1912, 6 ♀♀ (*S. A. Neave*, B.M.). PORTUGUESE E. AFRICA: East of Mt. Mlanje, 5.x.1913, 1 ♀ (*S. A. Neave*, B.M.); Monapo River, 30 miles from coast, 19.ix.1918 (*G. D. H. Carpenter*, H.D.). S. RHODESIA: Gambeza tsetse fly belt, x-xi.1929, 1 ♂ (*Dept. of Agriculture*, B.M.); Mpudzi River, Manica, 3,000 ft., 26.x.1905, 2 ♂♂ (*holo- and paratype*) (*G. A. K. Marshall*, H.D.); Urungwe, Gota Gota, 30.ix., 14.x.1938, 2 ♂♂ (*W. L. Williams*, D.A.); Vumba Mts., 1.xi.1935 (*Major Drysdale*, D.A.). TANGANYIKA: Tabora, Lulanguru, 3,766 ft., 28.x.1917, 1 ♀ (*G. D. H. Carpenter*, H.D.)

*Bactria (Promachus) guineensis* Wiedemann.

1828, *Analecta Ent.*: 25, No. 19.

The specimens listed below agree very well with the original description. They closely resemble *B. snowi*, but are rather smaller, the palpi have both black and yellowish-white bristles and the occiput and pronotum normally have yellowish-brown bristles (sometimes with a few black ones intermixed). The terminalia of the males are of precisely the same type, clearly showing near affinity, but the apex of the eighth sternite is rounded in *B. guineensis* (fig. 9), whereas it is angulate in *B. snowi* (fig. 8); the inner lobe of the upper forceps is not so large (fig. 2), and the aedeagus only slightly curved downwards distally (fig. 6).

*Specimens seen*: NIGERIA: Aro, 20.ii.1910, 2 ♀♀; Badagri, 30.i.1910, 1 ♀; Oshogbo, 28.ii.1910, 1 ♂ (*J. J. Simpson*, B.M.). Ibaden, Moor Plantation, 530 ft., ♂ and ♀ in cop. (*C. O. Farquharson*, H.D.); Ibaden, 25.ii.1910, 1 ♀ (*J. J. Simpson*, B.M.); Lagos, 1 ♂ (*G. Strachan*, B.M.). There is a further specimen from Oshogbo, 28.ii.1910, which agrees closely with *B. guineensis* in all respects except for the aedeagus, which is acuminate (fig. 4) and atypical for the genus (*cf.* my remarks on parallel acuminate forms noted in 1936, *Ent. Mon. Mag.*, 72: 233).

The female described under the name *P. guineensis* by Loew (1860, *Dipt. Fauna Südafrika's*, 1: 131-3) was from Caffrerei and probably represents another species, possibly *B. snowi*, as the occiput is 'oben mit schwarzen und blassfahlbräunlichen Borsten, an den Seiten und unten mit weissen Borsten und mit weisser Behaarung' and the palps are 'weiss behaart.'

Hope Department of Entomology,  
Oxford University Museum.  
April 8th, 1940.

*Polyommatus icarus* Rott. (Lep., Lycaenidae) single-brooded in the Hebrides. —This insect has occurred on practically every island we have visited and may, therefore, be regarded as the most widely spread of Hebridean butterflies, both in the Inner and Outer groups. Further, we have taken it in the months of May (Isle of Coll, 28.v.1939), June, July, August and September (Isle of Canna, 6.ix.1936). These dates, however, do not indicate the bivoltine nature of the insect, but simply represent a very protracted period of eclosion, as observations of wild larvae have definitely proved.—J. W. HESLOP HARRISON, King's College, University of Durham: April 25th, 1940.

### Obituary.

KENNETH J. MORTON, F.R.E.S., M.S.B.E.—It is with deep regret that we have to record the death of Mr. K. J. Morton from influenza on 29th January. It is, however, a consolation to know that, apart from deafness, he enjoyed good health right up to the time of his last illness, in spite of the fact that he was in his eighty-second year. He was a leading authority on the somewhat heterogeneous assemblage of insects known to the older generation of entomologists as the Neuroptera and his studies were world wide. His loss to the small band of workers on this group is a very serious one.

He was born at Carlisle on 5th August, 1858, and was educated at the village school under a severe old dominie whose word was law. He entered the British Linen Bank in 1874, and continued in its service for forty-eight years: in Glasgow until 1897, and afterwards in Edinburgh until his retirement in 1922. Although offered the post of manager, he declined this honour in order to have more leisure time for the pursuit of entomological studies. He collected insects from his youth, in his earlier years mainly on the River Clyde, and it was to that district that he took his friend Robert McLachlan when the latter visited Carlisle about the year 1886. In 1887 he was in Killarney with J. J. F. X. King, another enthusiastic Neuropterist. Wales, the Fen District, the New Forest and the south-eastern counties of England were all frequently visited, but his favourite happy hunting ground remained to the last the Highlands of Perthshire and Inverness-shire. His first visit to the Continent was to Switzerland in 1888, when most of the time was spent in the Chamonix region, very different then from what it is to-day, with its palatial hotels and never-ending traffic. In 1900 he spent a month in Norway. Two years later he collected in the south of France, and in 1904 spent a memorable holiday at Rheinau with Dr. Ris, the famous Odonatologist, a visit that was returned in 1906, when Ris came to Edinburgh to study the Morton collection. Except for the war period, collecting trips were made to the Continent in most years until 1931, Austria, France, Hungary, Italy, Spain and Switzerland all being visited in turn. From 1931 to 1939 his collecting was entirely confined to Scotland, for the most part to Midlothian, Perthshire and Inverness-shire.

His favourite order was probably the Odonata, although he made important contributions to our knowledge of the Trichoptera, Plecoptera, Ephemeroptera and Neuroptera. Mainly interested in systematics and distribution, he described a considerable number of new species belonging to these orders, and threw much light on the distribution of many others. Many interesting species have been added to the British fauna as a result of his industry and acuteness. He possessed a wonderfully quick eye for detecting the small but important differences between closely allied species, and his natural caution and painstaking researches prevented his falling into the many pitfalls awaiting the systematic worker in

the more obscure and difficult orders. A complete list of his writings would occupy too much space here, but the following items will give some idea of the scope of his work: 1893, Notes on Hydroptilidae [Trich.] belonging to the European fauna, with descriptions of new species (*Trans. ent. Soc. Lond.*, 1893: 75-82, pls. V-VI); 1894, Palaearctic Nemourae [Plec.] (*ibid.*, 1894: 557-574, pls. XIII-XIV); 1898, *Isopteryx torrentium*, Pictet and *I. burmeisteri*, Pictet; with notes on other species of the genus [Plec.] (*Ent. mon. Mag.*, 34: 158-60, figs. 1-4); 1900, Notes on the Scottish species of the genus *Hemerobius* [Neur.] (*Ann. Scot. Nat. Hist.*, 1900: 30-32); 1901-06, Notes on certain Palaearctic species of the genus *Hemerobius* . . . (*Ent. mon. Mag.*, 37: 163-5, 222-4, 12 figs.; 42: 146-8, 1 fig.; 1902, Notes on the females of arctic and northern species of *Apatania* [Trich.] (*ibid.*, 38: 150-7, pl. II); 1904, Further notes on Hydroptilidae belonging to the European fauna, with descriptions of new species (*Trans. ent. Soc. Lond.*, 1904: 323-8, pl. XXI); 1905, North American Hydroptilidae (*N.Y. State Mus. Bull.*, 86: 63-75, fig. 15 and pls. 13-15); 1910, A new species of *Polycentropus* (Trichoptera) (*Entomologist*, 43: 2-3, pl. II); 1910, Life-History of *Drepanepteryx phalaenoides* Linn. [Neur.] (*Ent. mon. Mag.*, 46: 54-62, pl. II); 1913, An addition to the list of British Plecoptera: re-instatement of *Chloroperla venosa* (*Entomologist*, 46: 73-6, pl. VI); 1914, Notes on the British species of *Symphherobius* (*Hemerobius*), including one hitherto unnoticed (*ibid.*, 47: 209-212, pl. V); 1915, Notes on Odonata from the environs of Constantinople (*ibid.*, 48: 129-134, figs. 1-4); 1919, Odonata from Mesopotamia (*Ent. mon. Mag.*, 55: 143-151, 183-196, figs. 1-3 and pl. V); 1920, Odonata collected in Mesopotamia by the late Major R. Brewitt-Taylor, R.A.M.C. (*Ann. Mag. Nat. Hist.* (9), 5: 293-303, pl. XIV); 1929, Notes on the genus *Leuctra* [Plec.] with descriptions of two new species, and on the genus *Capnia*, including a species new to the British fauna (*Ent. mon. Mag.*, 65: 128-134, pls. VI-VII); 1930, Plecoptera collected in Corsica by Mr. Martin E. Mosely (*ibid.*, 65: 75-81, pl. II); 1931, *Hemerobius perelegans* Stephens: a good species (*Entomologist*, 64: 197-201, pl. IV). His last paper was published in this magazine (to which he had been a regular contributor since 1882) in January of the present year (pp. 1-5) and dealt with the Odonata and Neuroptera of Perthshire.

The present writer is one of a number of entomologists whose studies owe much to the generous and sympathetic assistance of Mr. Morton. He was a prolific and gifted letter writer, and was always ready to place his vast knowledge at the disposal of friends. He was generous with material, and I personally owe much to his kind help in this way in being able to elucidate the life-histories of a number of our rarest British Neuroptera.

The sympathies of all entomologists will go out to his wife and family. His collection and library have been presented to the Royal Scottish Museum, Edinburgh.—F. J. KILLINGTON.

## Review.

'ADAPTIVE COLORATION IN ANIMALS.' By HUGH B. COTT, M.A., D.Sc., F.R.P.S., F.Z.S. With an introduction by Julian S. Huxley. Wide royal 8vo, pp. xxxii+508, coloured frontispiece, 48 plates, 84 figures. London: Methuen & Co 1940. Price £2.

This long awaited work by Dr. Cott has amply fulfilled expectation, and provides a mine of information on the whole wide subject of adaptive coloration in animals. The title itself is significant: there are colours in animals for which

no adaptive significance can be seen, but these are mainly internal colours, and it is with colours that meet the eye that we are concerned. These may fairly be claimed to be adaptive, and much evidence and argument is produced to show that they are so. Dr. Julian Huxley, in the preface, aptly calls to mind how often upholders of the theories of protective and warning coloration, and of mimicry, have been attacked as 'armchair theorists,' whereas the boot is really on the other leg. Criticisms come from studies and laboratories, often of exponents of modern work in genetics 'which for some unexplained reason is held to do away with adaptive interpretations.'

Dr. Cott is a whole-hearted follower of Poulton and has developed considerably one aspect of the subject, the value of disruptive coloration which breaks up the form and outline of an animal by contrasting patches of tone, often arranged quite independently of anatomy and on parts that only come together to make a whole when the animal is in its normal resting attitude. It is delightful to see how the same principle is applied on the doubled-up long legs of both frogs and grasshoppers. The whole book, indeed, illustrates over and over again how the same effects are produced by different means, a point of great importance for the interpretation by natural selection.

Emphasis is rightly laid upon the importance of seeing the creatures in their natural surroundings: 'there is no such thing as conspicuousness or concealment *per se*.' It is pointed out that in all the phenomena discussed pattern occurs only where it can produce a particular optical effect. Warning colours reveal, cryptic colours conceal, because they are so distributed and of such a kind that the result to the eye of a predator cannot be anything else.' Any explanation of cryptic phenomena is incomplete and unsatisfactory which does not take into account the *appearance produced*.' The author cites many experiments and observations to prove his points, and the need for further properly conducted experiments under conditions as natural as possible cannot be too strongly urged.

The whole gamut of animal life, marine and terrestrial, is called upon to provide examples of different types of coloration, and we are glad to see so much made of frogs and toads, for most workers on these problems have paid little attention to these animals; nevertheless, insects are largely utilised to exemplify the problems of adaptive coloration. Similarly, in regard to the question of what food is or is not eaten. Dr. Cott has examined a large number of Anura and claims that his records of stomach contents provide indisputable evidence of the selective feeding upon which McAtee has thrown such doubt. Comparison between predatory forms living in the same habitat, where the same food is available for different species, shows striking differences in the stomach contents. It must, however, be urged that even this method is subject to the drawback that there is no evidence of what was avoided: complete satisfaction could only be obtained by comparing stomach contents with a census of what was actually available to the animal when feeding.

The book is divided usefully into three main sections: Concealment, Advertisement, and Disguise. These fall into a natural order, for concealment is the simplest, and first, step. Advertisement can only succeed when accompanied by a greater measure of unacceptability as prey than is borne by individuals which attempt to elude capture, but which must form the bulk of the food of predators. Advertisement is of *comparative* value, and cannot stand alone. Only when advertisement is fully established as a well known phenomenon is *false* advertisement possible: this is the special form of disguise to which the term Mimicry should be restricted. The author does well to emphasise that, as Bates himself

pointed out, there is no essential difference between resemblance to an inanimate object, a stick or leaf, or another insect: a point usually disregarded by those critics who try to separate Mimicry as a special phenomenon peculiar to a few insects.

The section on Mimicry is somewhat small in proportion to the space allotted to other forms of protective coloration: it occupies only twenty-eight pages, while eleven pages are devoted to the single subject of resemblance to a dead leaf. The real intricacies of mimicry, the close correspondence in geographical distribution between models and mimic, and the value of polymorphism are lightly treated; it is somewhat unusual to find the name *Papilio dardanus* missing altogether!

Indeed, as a whole, the Cryptic aspect is a little out of proportion, and this is noticeable in regard to illustrations, though for such an expert photographer as Dr. Cott the temptation to reproduce many of the striking examples of insects on bark, etc., is easily understood. Thus there are forty-eight plates, but only the frontispiece, half of Plate 26, and Plates 47 and 48 are concerned with *revealing* coloration: these subjects are, of course, from their very nature less difficult than the examples of crypsis which Dr. Cott photographs with such skill. The frontispiece gives admirable examples of warning colours in Amphibia, but we look in vain for an example of an aposematic animal at rest in normal surroundings. All the photographs and sketches, as well as the clever diagrams explaining the optical principles involved, are by the author. Incidentally, we find Figure 43 somewhat puzzling, as the shadows do not seem to be consistent in arrangement. Plate 8 is a particularly convincing example of the value of countershading. Military authorities would do well to study this, for the first principles of camouflage often seem to be ignored. Quite recently a large photograph of a supposedly camouflaged gun appeared in one of the leading newspapers: the lower or 'ventral' surface of the barrel was painted a *darker* colour than the upper surface. Shades of Thayer!

There is so much to be admired in the book that a few adverse remarks must be made. The scattering of plates at random through the pages is tiresome, for in the text reference is only given to the number of the plate; a page reference would have saved much trouble. For instance, on p. 72, dealing with Coincident Disruptive Coloration (a special study of the author's), the reader is referred for examples to several plates. One is 23, opposite p. 176, and the other is 48, near the end of the book, and reference has to be made to the list of plates to know where to find them. Misprints are extremely few: the following mistakes will, we hope, be rectified in the second edition which will surely be demanded. *Clytus arietis* is not a 'tiger beetle' (p. 196); on p. 400, in a paragraph referring to Lycid beetles, the word 'those' is incorrect, for it is the elytra that are mimicked; on p. 221, 'Fig. 8' should be 81. The splendid list of references to 685 items shows how carefully the author has marshalled his overwhelming evidence, but the figures are much too small to be convenient to anyone but a myopic reader. An index of scientific names is separate from another for subjects and authors' names.

We congratulate both author and publisher on the production of a most interesting and valuable work which will form a standard book of reference for students of the whole wide subject as it should be, but often is not, studied. We trust it will lead to the greater body of observation and experiment in the field which the author, and all others interested in the subject, know to be so desirable.—G. D. HALE CARPENTER.

*Cissidae, Cisidae, Cioidae or Ciidae?*—The International Rules of Zoological Nomenclature, Art. 4, say that 'the name of a family is formed by adding the ending *idae* to the stem of the name of its type genus.' What, then, ought to be done with the family of Coleoptera of which the type genus is *Cis* Latreille 1790. The word is good Greek, *κίς*, a wood-worm or weevil, making its accusative *κίν* and its genitive *κίς*. Its root is certainly *κί*. The proper form is therefore equally certainly *Ciidae*. The only objection to this, a bad one, is its ugliness. If on this ground a case is to be made for an exception to the rules, *Cisidae* (treating the nominative as itself the root, which is not the truth of the matter) is the best. There is little to be said for *Cioidae*, which is sometimes seen, and still less for Fowler's *Cissidae*. A case for *Cisidae* can be based upon the ease with which the eye links it with *Cis*. *Ciidae* does not, at first sight, connect with it at all. But *Ciidae* is unquestionably right. — L. W. GRENSTED, Oriel College, Oxford: June 6th, 1940.

[Canon Grensted makes a very definite pronouncement upon this vexed question. But it is the etymologist rather than the entomologist that makes this pronouncement, and the two, as is well known, are not always in agreement. While admitting that the form *Cisidae* has some claims to preference, he omits to mention its strongest claim, the historical. The name appears to have originated (*vide* Dalla Torre in Junk, 1911: Col. Cat., pars. 30) with Samouelle (or Leach) in 1819. Lacordaire, 1857, Gen. Col., 4, doubled the 's,' no doubt to suit the pronunciation, while the classical purist with *Cioidae* (now found to be erroneous) does not appear until Gemminger and Harold's Catalogue, 1869 (a regular storehouse of illegitimate emendations and corrections). The form *Ciidae* is not referred to by Dalla Torre, though apparently first used by Alluaud, 1900 (see Scott, 1926, Trans. Linn. Soc. Lond., Zool., 19 (1): 1, footnote, who adopts it on much the same grounds as Canon Grensted) and is that used by the Zoological Record (since 1927), by Leng and Mutchler, 1933 (Cat. Col. Amer. north of Mexico, 2nd suppl.) and others.

Though it is true that the earliest form cannot claim the protection of the Law of Priority, which is applicable only to generic and specific names, yet it has this claim to precedence and to over a century of usage (in recent years it has been used in such standard works as Reiter, 1911, Fauna Germanica; Leng, 1920, Cat. Col. Amer. n. of Mexico; Winkler, 1927, Cat. Col. Reg. Pal.) as well as that of euphony and its obvious connection with *Cis*. Neither is there anything outrageous about the form *Cisidae* such as to make the entomologist with even a remote acquaintance with the classics blush to pronounce it, as is unfortunately the case with many names that do enjoy the protection of the law of priority.

But to take the Canon's argument: he assumes that he has to deal with the Greek word *κίς*, but in fact it is the latinized form of this, as adopted into the scientific jargon, that he is really concerned with, and this complicates matters. Is it essential that its stem in this latinized form should be the same as in the original Greek? Or may not the word when thus adopted by the scientists be treated as indeclinable, and thus afford a sound basis for our *Cisidae*? Alternatively, may not the latinized stem be *Cid-*, and hence the family name really *Cididae* (an excellent name on euphonic grounds)? At least we find, in compounds, the termination *-cida*, presumably also a latinized form from the same Greek root, much more frequently than, apart from the present family, the termination *-cis*. Not being a classicist, I am unable to answer these questions, but must leave them to others more competent.

For my part I have previously had occasion to consider which form of the name to use and have decided in favour of *Cisidae*, with its claim to precedence, long usage, euphony and obvious application, rather than of *Ciidae*, with its (pace my friend the Canon) not fully established claim to classical correctitude, or even, very regretfully, of my own bantling *Cididae*.—K.G.B.]

[By the courtesy of the Editors, I have seen Dr. Blair's reply to my note. I am afraid that the suggestion that *Cis* might be treated as a Latin noun does not help, and in any case would give no ground for taking *cid-* as the root. The *-cida* forms are not parallel at all. But apart from that, Dr. Blair gives much information as to the history of the different usages. It only remains to say that this does not affect the application of the rules, though when times are more propitious he obviously has the right to put in a case for their suspension in this instance.—L.W.G.]

*Larval colours in Notodonta sicca* L. (Lep.).—In the Hebrides *Notodonta sicca* feeds as a general rule on *Salix aurita* L. and in rocky places on the aspen (*Populus tremula* L.). Occasionally, as on Rhum and South Uist, the larvae may be taken from *Salix atrocinerea* Brot. The larvae are obviously light sensitive, as they vary in colour with the plant on which they are found. On aspen, the larvae are commonly of a dark slate colour, whilst on *Salix aurita* they are lightish. On *Salix atrocinerea*, however, the most noteworthy colour forms were noted. In Rhum this plant only grows in very sheltered places near Kinloch, where it is well grown and exhibits very clean, undamaged leaves; there the larvae possess a nearly white ground colour. On South Uist, the same plant, although often well developed, possesses leaves, much tougher in texture, which are often damaged so that they show inrolled patches of a reddish-brown colour. Here the larvae are of a beautiful rust-red colour, which, harmonising with the leaves, makes them hard to detect. Although I generally obtained them by beating, on account of the difficult nature of the ground I often searched for them; more than once I found myself attempting to collect leaves instead of larvae, so closely did the leaves and larvae approximate in colour and general appearance!—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne: April 25th, 1940.

*The ranges of Bombus smithianus* White and *B. agrorum* F. (Hym.) in the Isle of Rhum.—My first acquaintance with *Bombus smithianus* on Rhum took place in July, 1937, when Miss E. Bolton and I observed large numbers of queens on the sand dunes on Kilmory Bay in the north; no examples of *B. agrorum* were present. In 1938, when we lived on Rhum for three weeks, the insect was discovered to have a wider distribution and to be of common occurrence south and west of a line joining Camas Pliasgaig in the north to Bagh na h'Uamha in the east. North-east of this line it was replaced by its relative *Bombus agrorum*. When this observation was first made, I concluded that there was no overlapping of range. Later, however, the two species were captured on the same patch of marsh thistles on Camas Pliasgaig as well as on *Lotus major* Sm. flowers in the woods on the south shore of Loch Scresort. In the latter case, whilst *B. agrorum* swarmed, only one or two *B. smithianus* were noted. This station marks the deepest penetration of the latter species into *B. agrorum* territory. It will thus be seen that, although *B. smithianus* may be captured on all the varied geological formations represented in the Isle of Rhum, *B. agrorum* is restricted to the Torridonian Sandstones.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne: April 25th, 1940.

*Tachyusa coarctata* Er. (Col., Staphylinidae) in Herts.—This species, which has always been very rare in Britain, occurs in fair numbers on the sandy margin of a lake (formed by a disused gravel pit) at Cheshunt, Herts., where I first found it on May 10th of the present year. As far as I know, the only previous British records of the beetle are those given by Fowler (1888, Col. Brit. Isl., 2: 144), viz.: banks of the Mole, two specimens in 1862 (Power); Netherfield, near Hastings (Butler). The former locality appears to have been a short stretch of the river-bank between Mickleham and Burford Bridge, where I believe it was also taken very sparingly by other collectors of the time, but from which it has evidently long since disappeared. The species is easy to distinguish even in the field: it is intermediate in appearance between *T. constricta* Er. and *T. scitula* Er., having the colour of the latter and almost the build of the former.—A. A. ALLEN, 72 Windmill Lane, Cheshunt, Herts.: May 22nd, 1940.

*Thinobius newberyi* Scheerp. (*pallidus* Newb.) (Col., Staphylinidae) in Scotland.—This species has not apparently been recorded from any locality other than that where it was originally discovered by Mr. H. Britten, who took it very sparingly in spring and autumn under stones on a gravel bed at the side of a stream at Great Salkeld, Cumberland (*vide* E. A. Newbery, 1909, *Ent. mon. Mag.*, 20: 4). In July, 1938, two or three specimens were found under stones on sandy ground near the river Druie (a tributary of the Spey) near Aviemore, Inverness-shire, by Mr. P. Harwood and myself, thus constituting a new record for Scotland. Scheerpeltz (Winkler, 1924, Cat. Col. Reg. Pal.: 340) re-named the species as above, the name *pallidus* (Newbery, 1909) being preoccupied in the genus (Casey, 1889). This alteration must therefore be adopted.—A. A. ALLEN, 72 Windmill Lane, Cheshunt, Herts.: May 22nd, 1940.

*Zoological Gardens and the War.*—The Zoological Society, in pursuance of its policy in keeping the amenities of the Gardens available to the public as fully as possible during the war, in spite of operating at a serious loss, has now re-opened the Insect House, which was closed on the outbreak of hostilities. This involves an additional burden of approximately £250 per annum, but Council felt that the educational value of an insect collection warranted this. In regard to the larger animals in the Zoo, an adoption Scheme is now in operation by which the cost of feeding a particular animal is defrayed by a well-wisher, and material help has been obtained in this way. This would clearly be impracticable with insects, and it is accordingly suggested that entomologists might be interested in helping to 'adopt' the Insect House as a whole. One well-wisher has already given £25 for this purpose. Anyone interested in helping further with this scheme should send contributions to Mr. N. D. Riley, Keeper of Entomology, British Museum (Natural History), Cromwell Road, London, S.W.7, who will transmit them to the Zoo authorities.—Eds.

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PHILONTHUS ABYSSINUS FAUVEL AND ITS ALLIES (COL., STAPHYLINIDAE).

BY REV. C. E. TOTTENHAM, M.A., F.R.E.S.

It would appear that there are three species confused under the name *abyssinus* Fauvel. One of these occurs in Abyssinia, and I assume that this is the true *abyssinus* Fauvel. The second, which I



had separated in my collection a long time ago under the name *pseudabyssinus* sp.n., appears to be widely distributed throughout the southern half of Africa; while the third, of which I have only seen three specimens, occurs in Uganda.

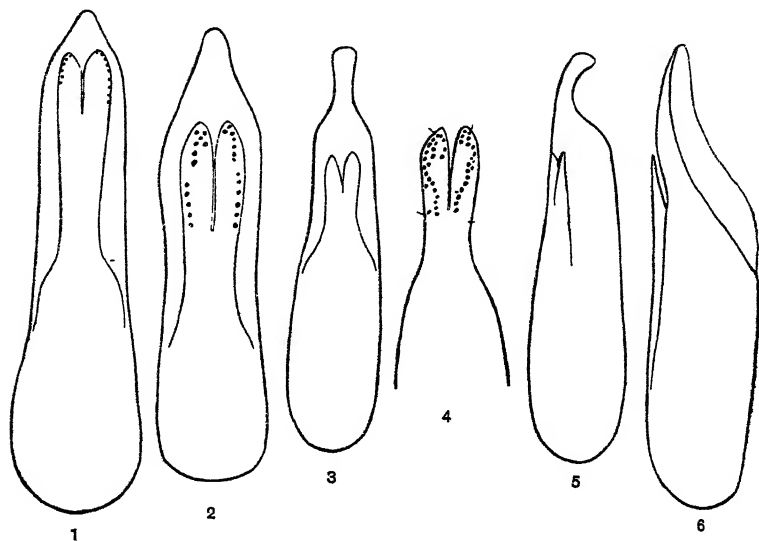
These three species form a group of very closely allied species which are extremely hard to distinguish from one another, a group as difficult as the *nigritulus* group of *Gabrius*. The external characters by which they can be separated from one another are few, entirely comparative and very slight. In fact there would be no justification for attaching any specific significance to them were it not for the very marked differences in the form of the aedeagus in the three species. But since the aedeagus forms a most reliable character for distinguishing species in the genus *Philonthus*, these differences cannot be passed over lightly. Although occasionally in the genus the aedeagus is not much help as a specific character, and although variability is shown in the pegs on the paramere in many species, *within limits*, yet the actual form of paramere and penis and often the arrangement of the pegs on the inner face of the former retain a constancy which makes the aedeagus of great importance as a specific character in the genus. The three distinct forms which are to be seen in the three species under consideration point to specific distinctness, in spite of the feebleness of other distinctive characters. Through the kindness of the authorities of the British Museum, I have been able to examine the series of *abyssinus* in the Museum collection, and it was amongst these that I detected the third species, which I call *elgonensis* sp.n.

### ***Philonthus pseudabyssinus* sp.n. -**

Differs from *P. abyssinus* Fauvel in the puncturation of the elytra, which is a little more regular and more uniform in size, and in the more even surface of the elytra.

The punctures of the abdomen are smaller and more numerous. This character can best be appreciated on the sixth tergite. In *abyssinus* the punctures consist of a basal row and a row at the extreme apical margin; there may be a few punctures between these laterally, but the space between these rows in the centre is always smooth. In *pseudabyssinus*, on the other hand, the basal row consists of more and finer punctures, and shows a greater tendency to be double; the punctures of the basal row are not confined to a single row in the middle of the tergite, but there are a few scattered punctures between it and the apical row. The chief difference between this species and *abyssinus* lies in the aedeagus. In the latter, the apex of the median lobe is short and triangular; the paramere is less deeply divided in the middle at the apex. In *pseudabyssinus* the median lobe is more elongate and more narrowed apically; the paramere therefore does not extend so nearly to its apex, and also the paramere is deeply divided longitudinally. These differences can be seen in figs. 2, 6.

*Type*: ♂, S. Africa, Delagoa Bay (in my collection). *Paratypes*: E. Africa, Morogoro (in my collection). Mashonaland, Salisbury (Marshall); Angola; Barberton (*P. Kendall*); Nairobi, v.1921 (*Dr. van Someren*); Belgian Congo, 18 miles south-west of Elisabethville, 1928 (*Dr. H. S. Evans*); (in British Museum (Nat. Hist.)).



FIGS. 1-3.—Aedeagus, lateral view: 1, *Philonthus abyssinus* Fauvel; 2, *P. pseudabyssinus* sp.n.; 3, *P. elgonensis* sp.n.

FIG. 4.—Inner face of paramere of *P. elgonensis* sp.n.

FIGS. 5-6.—Aedeagus, ventral view: 5, *P. elgonensis* sp.n.; 6, *P. pseudabyssinus* sp.n.

(N.B.—In figs. 1, 2, the position of the pegs on the paramere is indicated, but they are really on the inner face. In the specimens examined I have not been able to ascertain the number or position of the hairs on the parameres.)

### *Philonthus elgonensis* sp.n.

This species resembles *P. abyssinus* more than the preceding species in puncturation, but differs from both in having the posterior angles of the head much less rounded.

The aedeagus has the paramere deeply divided as in *pseudabyssinus*, but the median lobe is much more produced than in that species, blunt at apex and strongly bent over at the apex away from the paramere (see figs. 3, 4, 5).

*Type*, ♂, and *paratypes*, 2 ♀♀: Uganda, Mt. Elgon, 10,000 ft., Bamboo zone, 10.iii.1934 (*H. B. Johnston*) (British Museum (Nat. Hist.)).

c/o R. W. Lloyd, Esq.,

1, 5 & 6 Albany, Piccadilly, W.1.

April 13th, 1940.

*SUBMEDETERA CUNEATA* BECKER (DIPT., DOLICHOPODIDAE)  
NEW TO BRITAIN.

BY L. PARMENTER, F.R.E.S.

In an undetermined collection of Dolichopodid flies made by the late J. J. F. X. King which Dr. F. W. Edwards has kindly allowed me to study I found a male of the above species. It was taken at Aviemore, Inverness-shire on 12th July, 1913. This is an addition of a genus to our British list. The specimen is now in the British Museum (Nat. Hist.).

The species has a characteristic wing unlike any other known British fly of this family. It is a small green Dipteron similar to a *Thrypticus*, 2 mm. in length. It was first described and the wing figured by Th. Becker in 1917, *Nova Acta Leop. Carol.*, **102**: 361, who erected a new genus for it. Another figure of the wing and one of the genitalia, with a description, are given by O. Parent, 1938, *Faune de France*, **35** (Diptères Dolichopodidae): 395. To those collectors who use Verrall's keys, 1904-5, *Ent. mon. Mag.*, **40-41**, the genus runs down to *Thrypticus*, but differs from it by the peculiarly shaped wing.

The face and frons are brilliant metallic green with bronze reflections. Palpi black, antennae rounded and black with an apical arista. Lower postocular hairs dirty white. Thorax and abdomen metallic green. There are five pairs of brown dorso-central bristles. Hairs of abdomen whitish. Squamae brownish-white with yellowish-white hairs. Halteres yellow. Legs brownish-black, except hind femora which are green. Third coxae have two white bristles, upper one stouter than the lower. Wings are squared and broad at apex and lack the anal vein.

Parent states (*l.c.*) that it has only been found in Hungary and Russia. It is the only known species in the genus.

94 Fairlands Avenue,

Thornton Heath,

Surrey.

June 17th, 1940.

NOTES ON SYRPHIDAE (DIPTERA). IV.

BY J. E. COLLIN, F.R.E.S., ETC.

THE GENUS *NEOASCIA* WILLIST. (*ASCIA* MG. *nec* SCOP.).

Until Mr. R. L. Coe described his new species *N. obliqua* in the January number of this Magazine (pp. 18-19), there was in this genus only one known species with infuscated crossveins, viz. *N. podagrica* F., a common and easily recognised species, but there has always been considerable confusion in regard to the group of species with clear crossveins. Verrall in 'British Flies, Vol. VIII,

described three species of this latter group, but the specimens in his collection show that he had no knowledge of the true specific characters; he possessed specimens of two distinct species only and they were both placed under the name *dispar* Mg., his specimens of *floralis* and *geniculata* being only varieties of *dispar*. Three species of the group do however occur in Britain, and these were well differentiated (with the one exception of tarsal coloration) by Lundbeck in his 'Diptera Danica,' Vol. V, but it is quite certain that Lundbeck did not use the correct names for two of his species.

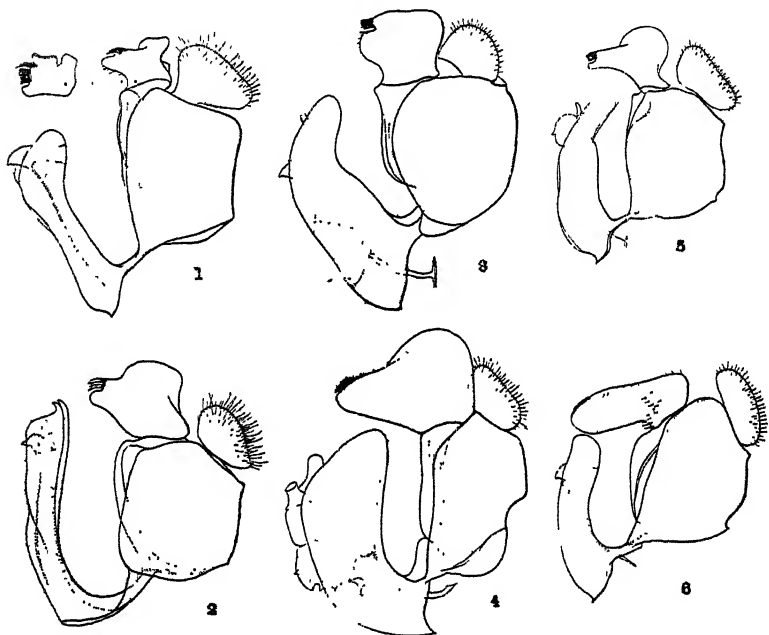
Meigen's *Ascia dispar* is represented in his Collection at Paris by a male and a fragment of a female. I have seen this male and it is Lundbeck's species *floralis*. It is true that Meigen's figure of *dispar* ♂ shows no yellowish patch on second abdominal segment such as is more usually present in Lundbeck's *floralis* than in his *dispar*, but Meigen's description of the hind femora of *dispar* as black with yellow base (*i.e.* black to the tip) agrees with the male in his collection and not with the species Lundbeck called *dispar* (= *ænea* Mg.). Specimens in Kowarz's collection labelled *dispar* agree with Meigen's male type.

When describing *dispar* Meigen gave a reference to Schrank, Fauna Boic. III, 2415, where a *Musca crassipes* was described, but the original *Musca crassipes* was described by Schrank in his Enum. Ins. Austr., p. 450, as a species 6 lines in length, which cannot possibly be *Neoascia dispar*. In Kertész's 'Katalog' a *Musca meticulosa* Scop. is given as a synonym of *N. dispar*; Scopoli's description of its habits indicate either a *Neoascia* or a *Syritta*, and if a *Neoascia* its occurrence 'in gardens' points to *N. podagrica*, for *N. dispar* frequents marshes, while Schrank's re-description of *M. meticulosa* in 1781 certainly applies to *podagrica*. There is however far too much doubt as to the identity of Scopoli's insect to justify using his name for any species.

Lundbeck's *N. dispar* is represented in Meigen's collection by *Ascia ænea* ♀, the type of which I have seen. Meigen thought that his *ænea* might prove to be the female of his *A. nitidula*, the type of which does not appear to be in Meigen's collection in Paris, but in view of the fact that I have never seen a male of *ænea* without the yellow crossband on abdomen I consider the synonymy most improbable.

*Neoascia geniculata* Mg. was described from an English female sent to Meigen by Dr. Leach and has generally been correctly identified.

A fourth species of this group of *Neoscia* with clear wings stood in Kowarz's collection under the name of *A. floralis* Mg., a single male labelled 'Marienb. V. 84.' This specimen answers fairly well to Meigen's description of *floralis*, and I propose to accept Kowarz's determination though I have proved by examination of the specimen that the male now standing in Meigen's collection under that name is only an immature *podagrica* in which the infuscation of the crossveins is almost invisible. There is no certainty that this was the male described by Meigen, nor has it been proved



FIGS. 1—6. *Neoscia* spp., genitalia in profile; 1, *N. podagrica* F.; 2, *N. obliqua* Coe; 3, *N. floralis* Mg.; 4, *N. aenea* Mg.; 5, *N. dispar* Mg.; 6, *N. geniculata* Mg.

that the female Meigen described was not the (at present unknown) female of Kowarz's male. I therefore retain *N. floralis* as a distinct species. Kowarz's specimen has epistoma rather less projecting than in *podagrica* or *dispar*; yellow bands on second and third abdominal tergites extending broadly over sidemargins, the first at about middle of second tergite and with some indication that it might be interrupted at middle, the second at base of third tergite

and with an isolated round dark spot at middle; four anterior femora with a broad dark tawny-brown ring near base, and tibiae with a narrow incomplete ring near middle; hind femora yellow only on basal fifth, and tibiae only on apical sixth; front tarsi yellow, middle tarsi with last 1-2 segments slightly brownish, hind tarsi with basal segment above and last two segments distinctly darkened. Wings with lower angle made by subapical crossvein not very rounded, in one wing with an exterior appendix. Rather larger than *N. dispar*. This species has not yet been found in Britain.

The six species known to me may be tabulated as given below, while the male genitalia of each one is quite distinctive.

#### TABLE OF SPECIES.

- 1 (4) Crossveins at end of subapical and discal wing-cells infuscated.
- 2 (3) Second abdominal tergite with a transverse yellowish band often indented or interrupted at middle. Depression on frons of female large and semi-circular. Male genitalia fig. 1 ..... *podagrica* F.
- 3 (2) Second abdominal tergite with oblique yellowish side stripes sloping forwards towards median axis. Depression on frons of female confined to a comparatively narrow middle channel. Male genitalia fig. 2. .... *obliqua* Coe
- 4 (1) Crossveins not infuscated.
- 5 (9) Third antennal segment decidedly longer than broad, if only slightly longer hind femora not narrowly yellow at tip.
- 6 (7) (8) Abdomen in male (female unknown) with yellow crossbands on both second and third tergites extending widely over sidemargins. Epistoma not so produced as in *podagrica* or *dispar*. Male genitalia fig. 3. (Not British. Only one specimen examined) ..... *floralis* Mg.
- 7 (6) (8) Abdomen in male with yellow crossbands on only third tergite *extending for whole width over sidemargin*. Pregenital abdominal segment black haired. Four anterior tibiae yellow, or with only a brownish ring; hind femora narrowly yellow at tip as well as at base. *Female* with second abdominal segment narrowest just beyond base, then very rapidly widening. Antennae longer. Depression on frons large and occupying almost entire width. Male genitalia fig. 4 ..... *aenea* Mg.
- 8 (7) (6) Abdomen in male often with yellow markings on second tergite which never extend to sidemargins, and a band on third tergite of which at least *the front* corners never extend to sidemargins. Pregenital abdominal segment pale haired. Four anterior tibiae (except in immature specimens) with a distinct dark ring. Hind femora black to tip. *Female* with second abdominal segment narrowest at base and gradually widening. Antennae shorter. Depression on frons confined to a comparatively narrow middle channel. Male genitalia fig. 5. .... *dispar* Mg.
- 9 (5) Third antennal segment very short (scarcely longer than broad). Hind femora very narrowly yellow at tip. Male genitalia fig. 6. .... *geniculata* Mg.

*N. podagrica* F. is universally common in Britain.

*N. obliqua* Coe. See the description in the recent number of this Magazine (pp. 18-19). I am indebted to Mr. Coe for pointing out the differences between *aenea* Mg. and *dispar* Mg. in the male pre-genital abdominal segment, and the depression on female frons.

*N. aenea* Mg. (*dispar* Ztt., Lndbk., etc., *nec* Mg.) is not so common as the true *dispar* Mg., but occurs in similar marshy localities. I have records from Hants, Wilts, Berks, Suffolk, Notts, and Inverness. The male hypopygium is distinctly larger in proportion to size of insect than in *dispar*, while the shape of female abdomen is very distinctive.

*N. dispar* Mg. (*floralis* Ztt., Lndbk., etc., *nec* Mg.) is often very abundant in marshy localities. It varies considerably in size, abdominal markings, and leg coloration; in particular the character of the yellow last two segments of front tarsi, used by Lundbeck as a distinction for this species from *geniculata* Mg. is of no value; these two segments may vary from yellow through varying degrees of brown, on to black, the latter colour being usual in specimens from Scotland. It is a species with a wide distribution in the British Isles.

*N. geniculata* Mg. is probably an overlooked species. I have seen specimens from Hereford, Brecon, Glamorgan, Notts, Cambs, Norfolk, and from Haddington, and Inverness to Scotland.

#### *CHRYSOTOXUM OCTOMACULATUM* CURT., *ELEGANS* LW. AND ALLIED SPECIES.

The above two British species of *Chrysotoxum* (apart from the easily recognized *C. bicinctum*) were tabulated by Verrall in 'British Flies,' Vol. VIII, as distinguished by having the third antennal joint shorter than the two basal ones together (*i.e.* the first joint never particularly short), and the interrupted yellow abdominal bands or 'bows' continued over the sidemargins. Of these two species *C. octomaculatum* Curt. was described from specimens taken on the Hampshire and Dorsetshire heaths, and an accumulation of a considerable number of specimens from these heaths has convinced me that Verrall's *octomaculatum* was not this species. This opinion has now been confirmed by the examination of a very long series of a *Chrysotoxum* taken by Mr. N. D. F. Pearce of Cambridge at Harpenden (Herts.) in July, 1929, '30 and '32, which are certainly Verrall's *octomaculatum*, are quite distinct from the 'Heath' species, and which I propose shall in future be known as:

**C. verralli** sp.n ♂ ♀ = *C. octomaculatum* Verr. nec Curt.

Primarily distinguished from any species of this group by the straighter front margin to the yellow first (basal) interrupted band on abdomen, this band becoming progressively wider outwardly nearly to sidemargins.

♂. First antennal joint long, longer than either second or third (measured on inner side). Abdomen more extensively yellow than in any other species of this group, the transverse dark markings being very narrow, and the yellow hindmargins to tergites correspondingly broad. Median vertical dark line connecting the two transverse dark lines on each tergite also very narrow. This narrowness of all dark markings gives abdomen a general resemblance to the paler forms of *C. arcuatum* L. Basal dark markings on tergites 3 and 4 extending to sidemargins without interruption. Usually only the basal stem present of the customary  $\lambda$ -shaped dark markings on fifth tergite, forming a projection from the basal transverse dark line. Ventral dark markings very similar to those of *octomaculatum* Curt., but narrower.

♀. Resembling male, especially in the narrow longitudinal connecting line and narrow transverse dark markings on abdomen. Hairs on sides of thoracic disc of usual length, those on postalar calli rather longer than callus is wide. Some longer hairs mixed with shorter ones on scutellum. The  $\lambda$ -shaped dark markings on fifth tergite usually show some interrupted indication of the 'arms,' but these are straight not curved. Fifth sternite with a similar but smaller dark marking to that on fourth.

Length (without antennae) 8—11 mm., but usually about 10 mm.

Of Verrall's records under the name *octomaculatum*, the Merton, Dickleburgh, and Godalming specimens are the above described species, only the Lyndhurst specimen being the true *octomaculatum* Curt. In addition to the Harpenden (Herts.) specimens mentioned above, I have records from Timworth (Suffolk), Chippenham Fen and Fleam Dyke (Cambs.), and Fowl Mere near Wretham (Norfolk).

#### *C. octomaculatum* Curt.

Front margin of yellow interrupted band on second tergite more convex, and basal dark band on (at least) fourth tergite with a yellow interruption just before sidemargin. Hairs on sides of thoracic disc very short in female.

♂. Very much like *verralli*, but basal antennal joints shorter in proportion to third, first longer than second but not so long as third (measured on inner side). Yellow interrupted band on second tergite more even in width and consequently more arched on anterior margin. All dark markings on abdomen slightly wider, basal dark transverse marking usually interrupted just before sidemargin on third tergite, and always interrupted on fourth tergite. The  $\lambda$ -shaped dark marking on fifth tergite, when present, bell-shaped, the 'arms' being slightly curved, not straight. Ventral dark markings very much as in *verralli*, but somewhat wider.

♀. In addition to the characters given for male, is very distinct in having



much shorter pubescence at sides of thoracic disc, notably hairs on postalar calli shorter than callus is wide.

Length (without antennae) 8.5–12 mm., usually about 11 mm.

Curtis' specimens were from Bournemouth, Lulworth, Portland and Stourton Caundle. The Lulworth and Portland specimens were stated by Curtis to have been taken by Dale. I have examined the specimens standing under the name *C. octomaculatum* in the Dale collection at Oxford, but there are none labelled Lulworth or Portland; as usual many of the specimens are without history, and two such specimens are females of the above-described *octomaculatum*; two others without history (one with a small square pink label), one labelled 'S.C. Aug. 1833,' and one 'G. Wootten 1902,' are females of my *C. latilimbatum*, while two others labelled '1222' and 'G. Wootten 1833' respectively are females of *C. cautum*. The two species *octomaculatum* and *latilimbatum* are superficially very much alike and Curtis may very well have included both species under his *octomaculatum*, but it seems reasonable to limit his name to the species known to frequent more commonly the Dorsetshire and Hampshire heaths. My specimens are from Studland, Arne, Canford Heath, Hurn, and Beaulieu Road on dates ranging from end of May to end of August.

The interruption near sidemargin of basal dark bands on abdominal tergites was noted by Rondani for his *C. chrysopolita* which has been considered a synonym of *octomaculatum* Curt. Giglio-Tos however maintained that they were distinct species, *chrysopolita* having longer third antennal joint and wider transverse dark abdominal markings, especially the apical transverse band on second tergite usually obliterating the yellow hindmargin, and that on third and fourth tergites leaving narrower yellow hindmargins than in *octomaculatum*. I believe that I possess Continental specimens of *chrysopolita* Rdi., which were included by Kowarz and Bigot under their *C. elegans*; if so the female has short hairs on postalar calli similar to *octomaculatum*, but the dark abdominal markings are certainly much wider than in British *octomaculatum*.

#### *C. elegans* Lw.

Here again it is certain that Verrall did not describe and figure typical *elegans*, but a closely allied and apparently undescribed species which I propose to name *latilimbatum*. Loew described his *C. elegans* from females only in which the dark markings on abdomen were certainly more extensive than in Verrall's species, for he wrote of narrow yellow hindmargins to segments, and of

that on second segment being usually visible only about the middle, and it should be noted that the contrast between Loew's species and *latilimbatus* in the width of the yellow hindmargins is much greater in females than in males.

In true *elegans* Lw. there is the appearance of a very broad dark band between the interrupted yellow bands, owing to the apical dark band of one tergite being so little separated from the basal dark band of the next tergite, thus producing a superficial resemblance to *C. festivum*; the yellow bands however reach the sidemargins and there is no dark cloud on the wings.

The only specimen of true *elegans* Lw. among Verrall's series was that mentioned by him as taken at Bewdley (Worcs.), but I caught a number at Barton Mills (Suffolk) on June 1st, 1933, on *Caltha* blossoms, two more at Fowl Mere, near Wretham (Norfolk) on May 26th and August 15th, 1938, and possess an old specimen taken at Woking (Surrey).

***C. latilimbatus* sp.n. ♂♀ = *C. elegans* Verr. nec Lw.**

Differing from true *elegans* Lw. in having wider yellow hindmargins to abdominal tergites (much wider on tergites 3 and 4), the posterior transverse dark marking on each tergite being well separated from the anterior dark marking on next tergite. In the female these posterior dark markings are often abbreviated or even absent on tergites 3 and 4, causing a greater resemblance to the female of *octomaculatus* than to the female of *elegans*; the longer hairs on sides of thoracic disc (including postalar calli) of female *latilimbatus* however easily distinguish it from female *octomaculatus*. The male might readily be mistaken for a large male of *octomaculatus* and is perhaps best distinguished by the more equal length of the three antennal joints, though the entire anterior dark band on tergites 3 and 4 (i.e. not interrupted close to sidemargins) affords a further distinction. The figure of *elegans* abdomen given by Verrall is that of a male *latilimbatus* in which the yellow hindmargin to third tergite is not quite so wide as usual.

Length (without antennae) 11.5—13 mm.

This species has been found, up to the present, only in the counties bordering the south coast, from Devon to Kent.

***CHAMAESYRPHUS CALEDONICUS* sp.n. (= *C. LUSITANICUS* Sharp 1903, nec Mik 1898).**

In this magazine for 1903, p. 197, Dr. D. Sharp introduced *Chamaesyrrhus lusitanicus* Mik as British on the strength of a male taken at Boat-o'-Garten (Inverness-shire) in July of that year, and commented on the remarkable case of a species known from only Cintra (Portugal) occurring in Scotland. In August, 1935, both Mr. Colbran J. Wainwright and I caught a few specimens of the same species at Culbin Sandhills, near Forres (Elginshire). A comparison of these specimens with the cotypes of Mik's *C. lusitanicus* in my possession proved that the resemblance which led Sharp to

consider them conspecific was only superficial; in fact in certain characters mentioned later, while true *lusitanicus* agrees with *scaevoides*, the Scottish species agrees with *Pelecocera tricineta*. I have not been able to examine the type of *Pelecocera pruinoso-maculata* Strobl described from a single Spanish female, but from the description it certainly has a *Chamaesyrrhus* antenna, and is much more likely to be the unknown female of *lusitanicus* Mik than to be the same as our species from Scotland. This being accepted, it becomes necessary to give a new name to *C. lusitanicus* Sharp *nec* Mik, and it seems appropriate that it should be called—

***C. caledonicus* sp.n., ♂ ♀.**

Superficially resembling *C. lusitanicus* Mik, but differing from both that species and *scaevoides* Flin. in having male frons not so constricted at middle, the lunule immediately above antennal base not dusted greyish, no long mesopleural bristle (*scaevoides* has a long yellowish bristle, and *lusitanicus* a long dark one) near upper hind corner of mesopleura, notopleural depression and suture more densely dusted, outer discal crossvein less parallel to hindmargin of wing. It resembles *lusitanicus* and not *scaevoides* in having arista inserted nearer to tip than to base of third antennal joint, in being generally darker with darker legs (though *scaevoides* varies in this character), and the abdominal yellow side patches with a greyish sheen, or often entirely greyish.

Length about 5 mm., but probably variable as in the other species.

In *C. scaevoides* Flin. and *lusitanicus* Mik, while the semicircular ridge of the frontal lunule is shining, the more or less triangular extension downwards towards point of insertion of antennae is dusted. In *C. caledonicus*, as stated above, this triangle is devoid of dust, and it is in this character, as well as the discal cross-vein being less parallel to wing-margin, and (more remarkable still) in the absence of the longer mesopleural bristle, that *C. caledonicus* agrees with *Pelecocera tricineta* and not with the other two species of *Chamaesyrrhus*. It makes one very doubtful of the value of the single character (shape of third antennal joint) by which the two genera are at present distinguished.

In *C. lusitanicus* Mik the upper margin of the mesopleura is hairy for its whole length up to the prothoracic spiracle; in *scaevoides*, *caledonicus* and *Pelecocera tricineta* the hairs are confined to the convex hinder part, and the flatter anterior part (about half the length of upper margin) is bare.

It should further be noted that the central facial stripe is always more distinct and less dusted in the female of *scaevoides* than it is in the male.

Raylands,  
Newmarket.

June 16th, 1940.

## Obituary.

*H. J. Carter.*—It is with the deepest regret that we learn of the death at Sydney on April 16th of H. J. Carter, B.A., F.R.E.S., at the age of 82. Of English birth, and educated at Mill Hill School and Cambridge, Carter went to Australia in 1881 as a master in the Sydney Grammar School, a post he held until 1902, when he was appointed Principal of Ascham School, a position from which he retired over twenty years ago. It was not until after his arrival in Australia that he developed any interest in entomology, an interest that was to a large extent spurred on by the enthusiasms of his own growing family. Realising from experience the need for revisionary work of what scattered knowledge there was rather than the continued accumulation of long lists of new species, Carter devoted his energies mainly to work of this nature, in the course of it himself describing some hundreds of new species. His revisions of the Australian Tenebrionidae and Buprestidae, two families highly developed in the Australian fauna, as well as of certain groups of the Cerambycidae, and latterly of the Dryopidae and Colydiidae, will long form the basis of all future work on these sections of the Australian fauna. In 'Gulliver in the Bush,' reviewed in this Magazine (1933, 69: 141-2), he gives a vivid and interesting account of his collecting trips in the different States of the Commonwealth and of the friends, entomologists and others, that he made in the course of them. His extensive collections he left to the Australian Museum, Sydney, but he was always generous in the presentation of paratypes and material to the British Museum, to which he paid long visits in 1907 and 1922 and with which he maintained a constant correspondence.—K.G.B.

## Reviews.

'THE FABRICIAN TYPES OF INSECTS IN THE HUNTFRIAN COLLECTION AT GLASGOW UNIVERSITY. COLEOPTERA, PART II.' By ROBERT A. STAIG, M.A., Ph.D., F.R.S.E. 8vo, pp. x+164, pls. 29—59 (coloured). Cambridge University Press. 1940. Price 27/6 net.

This is an interesting and valuable volume which places these types, as far as possible, on permanent record with full descriptions. Types cannot last for ever and it is most important for the student that a record such as is contained in this book be preserved. There are thirty-one fine coloured illustrations of the insects described, which are species of the families Endomychidae, Coccinellidae, Helodidae, Buprestidae, Elateridae, Tenebrionidae, Oedemeridae, Rhipiphoridae, Meloidae and Pyrochroidae.—R.W.L.

'ANIMALS WITHOUT BACKBONES: An Introduction to the Invertebrates.' By R. Buchsbaum. 8vo, pp. ix+371, illustrated. University of Chicago Press (in U.S.A.), Cambridge University Press (in Great Britain). Second impression, 1939. Price 30s.

This general text book of invertebrate zoology appeals to the eye in its liberal use of half-tone photographs and the extremely clear and original line drawings. The text attempts to be as non-technical as possible, but is suitable for use in an introductory biology course at a University, by school teachers, scholarship candidates and general naturalists. Insects generally receive scanty treatment in the average zoological text-book, and it is refreshing to find in this volume well over a hundred of the very numerous illustrations devoted to entomological matters; other Arthropoda are also well provided for

'ZOOLOGY OF OXFORDSHIRE.' Reprinted from the Victoria County History of Oxfordshire. Vol. I, pp. 57-222. Edited by B. M. HOBBY, M.A., D.Phil., F.R.E.S. 1939.

This latest instalment of the Victoria County History series includes, in spite of its title, only the Mollusca, Arthropoda and Vertebrata, the great bulk of it being devoted to the insects (pp. 62-178). The county suffers from certain physical disadvantages, such as the lack of coastline and of heathlands, each of which adds a notable item to the fauna of a county, as well as the eccentric position of Oxford itself, half of its well explored environs being in the county of Berkshire. In spite of these disadvantages, at least as regards the more generally collected Orders, the lists produced are exceeded by those of few counties, the Coleoptera, for example, just topping the 2,000 mark. In the more neglected Orders, however, little has yet been done, and it is to be hoped that the very defects of this present list will but provoke the study of the more neglected groups and stimulate the exploration of the less well known areas of the county. Dr. Hobby and his able band of collaborators are much to be congratulated upon the production of a worthy member of this valuable series of county lists.—K.G.B.

'THE LOUSE: An account of the lice which infest man, their medical importance and control.' By Prof. P. A. Buxton, M.A., M.R.C.S., L.R.C.P. 8vo, ix+115 pp., 28 figs. London: Arnold & Co. 1939. Price 7s. 6d.

The publication of this authoritative book at a time when the nation is at war and when mass movements of populations are taking place is most opportune. In it the medical officer, clinical and social worker, sanitary inspector and entomologist will find much valuable information which will assist them to understand the louse, the problems it creates and how it may be controlled. The work is arranged in six chapters: the first discusses the zoological position and general biology of the Anopleura; the second and third describe respectively the anatomy and biology of *Pediculus humanus*; the fourth, in which typhus, trench fever and relapsing fever are considered, gives an account of its medical importance; the fifth suggests control methods, and the concluding one is concerned with the crab louse (*Phthirus pubis*). An appendix indicates methods of rearing lice and of feeding and infecting them by rectal injection. A list of over a hundred references and an index conclude the work. The bold illustrations are most effective and at the price offered the work is excellent value.

'GENERAL INDEX TO THE THIRTY-EIGHT ANNUAL REPORTS OF THE ENTOMOLOGICAL SOCIETY OF ONTARIO: 1900-1937.' By C. E. PETCH. 267 pp., 8vo. Published by the Ontario Department of Agriculture, 1939.

This index is a most useful source of information concerning Canadian insects, arthropods, fungi, spray materials, etc. It adopts the sound indexing procedure of including all references without attempting to assess their importance. Superseded names are in many instances cross-indexed to the more modern forms and common names to scientific ones. The arrangement is alphabetical and not systematic.

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*Early Vanessa cardui* L. (*Lep.*) in Dorset.—We observed four specimens of this migrant butterfly at Ringstead Bay on March 31st and April 1st, 1940. —E. J. and H. J. M. BOWEN, 10 Park Town, Oxford: June 5th, 1940.

*An early Vanessa cardui L. (Lep.) in Hampshire.*—A *Vanessa cardui* L. was seen flying here on April 3rd, a warmish day with a moderate N.W. wind after a frosty night.—F. H. HAINES, Appleslade, Linwood, Ringwood, Hampshire: May 24th, 1940.

*A Willow Wren taking Dragonflies.*—There was a great 'hatch' of *Pyrrhosoma nymphula* Sulz. on the pond here on May 3rd, and many very soft teneral imagines were feebly flying by the water. I saw a Willow Wren (*Phylloscopus t. trochilus* L.), perched on a bush near, making flight after flight after these insects to secure them as prey. It appeared to swallow the whole dragonfly at once easily, and to be taking heavy toll. Neither rejected wings nor other parts could be found about.—F. H. HAINES, Appleslade, Linwood, Ringwood, Hampshire: May 24th, 1940

*Attacks of birds on Pieris brassicae L. (Lep.).*—Whilst sitting in our garden at Cardiff, Glamorgan, at 3 p.m. on 19th May, 1940, I saw a *P. brassicae* L. alight on the ground. A House Sparrow flew down from a railing, secured the butterfly, manipulated it with its beak until it had detached the wings, and then ate the body. I went to the spot and found all four wings, some of which were beak-marked. White butterflies have been abundant at Cardiff this year, but I am not aware of another instance of one being attacked.

At 4 p.m. on 21st May, 1940, I was at Porthcawl, Glamorgan, where I saw on the ground in a garden at Arlington Place a large quantity of butterflies' wings. The owner of the garden told me that House Sparrows had been very busy catching the butterflies and that the loose wings were the result of their activities. There were no birds about while I was there. I collected the wings, which all belonged to *P. brassicae*. The result was: males, 16 pairs of fore-wings and 2 left fore-wings; females, 11 pairs of fore-wings. These represented at least 29 butterflies. There were also 36 hind wings and 11 fragments of wings. Many of the wings were beak-marked. I was informed that white butterflies, their larvae and pupae, were very abundant in this locality last autumn. It will be remembered that the 1939 season was remarkable for immigration of Cabbage Whites, which extended from the end of May to the end of August.

All the wings mentioned are preserved in the Hope Department of Entomology, Oxford University Museum.—W. E. COX, 279 Albany Road, Cardiff: June 17th, 1940.

[Somewhat similar observations have been recorded recently by G. D. H. Carpenter, 1940, *Nature*, 145: 900, and F. W. Frohawk, 1940, *Entomologist*, 73: 137-8.—Eds.]

*Aphodius scybalarius F. var. nigricans Muls. (Col., Scarabaeidae) in Oxford and Dorset.*—In the course of clearing up some recent acquisitions in the Hope Department at Oxford, I came across a black *Aphodius*, taken by Prof. G. D. H. Carpenter on the sandhills at Studland, Dorset, on April 10th, 1937, which I could not at first sight match with any British species. On examination it proved to be *A. scybalarius* F., a species in which the yellow elytra are very often partially clouded over an area covering the middle part of the outer interstices. In this specimen the first two interstices are actually a very dark pitchy brown, and this colouring extends, near the apex, over the next three interstices also. It is thus a dark specimen of what Mulsant intended by his var. *nigricans*, Col. Fr. Lamell, 1840, p. 179:—'Var A. *A. nigricans*; Nob. Tache des élytres couvrant presque entièrement leur surface et ne laissant que leur extrémité plus claire.'

He cites in synonymy: Sturm, 1805, Deutschl. Fn. 1, p. 92, 8 (*scybalarius*), var. c. (ganz schwarz nur die Spitzen der Flügeldecken braun); Dufts., 1805, Fn. Austriae, 1, p. 106, 21 (*scybalarius*), var.  $\gamma$  (*elytris nigricantibus*); Schmidt, Zeits., 2, 1, p. 100, 8, var.  $\gamma$ .

In Hist. Nat. des Coléoptères de France (E. Mulsant and Cl. Rey, Paris, 1871, p. 171) he seems to merge this form with his earlier var. *argillicolor*, which has the elytra uniformly of a yellowish brown, calling them simply var. c. G. Portevin, in his Hist. Nat. des Coléoptères de France, Paris, 1931, Vol. II, p. 27, has 'noir avec l'apex brun (ab. *nigricans* Muls.),' thus going back to the original description.

This means that when N. H. Joy in his Practical Handbook of British Beetles, London, 1932, p. 251, speaks of specimens with the elytra 'black with interstices 1-2 partly yellow' as var. *nigricans* Muls. he is going rather a long way from the original description. Such specimens are not infrequent, but they are very unlike the black specimen from Studland, which is obviously the form which Mulsant intended.

The true var. *nigricans* Muls. seems to be very infrequent in this country. Dr. K. G. Blair tells me that he could not match this specimen in the collections at the British Museum. I have found one other, labelled 'Oxford district,' in the J. J. Walker collection at Oxford. It is obviously an extreme form, which occurs rarely.—L. W. GRENSTED, Oriel College, Oxford: April 19th, 1940.

*Calliphora uralensis* Villen., *Hydrophorus albiceps* Frey and other Diptera in Scotland, 1939.—In 1939 my friends Messrs. P. W. E. Currie and K. M. Guichard were kind enough to collect some Diptera for me when they visited Scotland. The former, at my request, especially paid attention to the 'blow flies' when in the Shetlands. From a 'blown' dead Arctic Skua nestling found on the Isle of Noss on July 1st several *Calliphora erythrocephala* Mg. of both sexes hatched. This species was also taken by Mr. Currie at Lerwick in June and at Baltasound in July. I was very pleased, however, to find that *C. uralensis* Villen. occurred in the Shetlands. Specimens were taken at Lerwick in June and at Baltasound in July. The species was first introduced to the British List by Mr. C. J. Wainwright in 1932, *Trans. ent. Soc. Lond.*, 80: 422-3, but little was known of its distribution. Mr. Currie also took *Ornithomyia lagopodis* Sharp on a young Merlin and on a young Lapwing. Mr. J. Smart, in F. W. Edwards, H. Oldroyd and J. Smart, 1939, British Bloodsucking Flies: 127, gives one record for this species on Merlin. The other host is given both as Peewit (p. 121) and Green Plover (p. 127); these names are synonymous with Lapwing.

At Portree, Skye, in August Mr. Guichard captured, amongst other Syrphidae, *Ischyrosyrphus laternarius* Müller, *I. glaucius* L. and *Chrysotoxum arcuatum* L. At Uig, Skye, in August he took *Hydrophorus albiceps* Frey (four ♂♂, one ♀) on small pools. This species is not included in Verrall's Dolichopodidae Tables (1904-5, *Ent. mon. Mag.*, 40-41). It is easily distinguished by the presence of a tooth situated ventrally towards the apex of the front femora of the male. Though Parent in 1938, Faune de France, 35 (Diptères Dolichopodidae): 281, gives Verrall's *Hydrophorus borealis* Lw. as being the true *borealis*, I believe he is mistaken and that Verrall's species is really *albiceps* Frey. This is apparently known to other British Dipterists, since there is a series labelled *albiceps* Frey in the British Diptera collection at the British Museum (Nat. Hist.) and no *borealis* Lw.—L. PARMENTER, 94 Fairlands Avenue, Thornton Heath, Surrey: June 17th, 1940.

## NOTES ON BRITISH COLLEMBOLA.

BY RICHARD S. BAGNALL, D.SC.

This, the seventh part of the series, is continued from *Ent. Mon. Mag.*, LXXXVI, pp. 97-102 (1940) and, to the best of my knowledge, the following are new to the British fauna :—*Achorutes gibbosus* sp.n., *A. burkilli* sp.n., *A. britannicus* sp.n., *A. browni* sp.n., *A. sahlbergi* Reut., *Neanura graccei* Den., *N. hystrix* sp.n., *Proisotoma sphagneticola* sp.n. and *Architomocerura litsteriana* sp.n., whilst *Achorutes longispinus* var. *scoticus* Carp. & Evans is redescribed as a good species belonging to the *armatus* group.

The generic names *Achorutes* and *Neanura* are reinstated for *Hypogastrura* and *Achorutes* of most European workers, respectively, and the genus *Parisotoma* nov. is diagnosed for the *notabilis* group of *Isotoma*.

A beginning is made towards the elucidation of the British species of *Achorutes*, with, it must be admitted, somewhat surprising results.

A number of the species now recorded are particularly noteworthy, such as the two species of *Neanura* (a genus represented by but a single British species for over a hundred years), *Proisotoma sphagneticola* and, not least, *Architomocerura litsteriana*, this last-named species helping us to gauge more accurately the true position of the genus in our classification.

Genus *Achorutes* Templ.

No apology need be made for reinstating the old and familiar generic name *Achorutes* in place of *Hypogastrura*. This latter name was revived by Börner in 1906 and adopted by most European authors, although as far back as 1916 Folsom clearly stated that in 1839 Bourlet erected the genus *Hypogastrura* to receive a single species, *Podura aquatica* L., and in 1842 he used the same name in a new sense for species of *Achorutes*. *Hypogastrura* (1842) is therefore a homonym and the type of the genus is *Podura aquatica* L., and not *Achorutes murorum*.

I am accumulating material with a view to studying the 'armatus' and 'purpurascens-pseudopurpurascens' groups in particular. The results from the study of a comparatively small amount of material would suggest that the genus is a somewhat extensive one.



TABLE OF THE BRITISH SPECIES OF THE *ARMATUS* GROUP OF THE  
GENUS *ACHORUTES*.

1. Anal papillae touching at their bases; Ant. III—IV with eversible sac.  
AH approximately as long as or slightly longer than claw III ..... 2.
- Anal papillae not touching at their bases ..... 3.
2. General colour dark bluish-grey to black. Setaceous production of emp.  
app. exceptionally long, filiform and reaching apex of claw or beyond  
Mucro with dorsal triangular lobe of outer lamella larger. Abd. V—VI  
with strongly tuberculated raised areas. Habitat in sphagnum.  
..... *scoticus* (C. & E.) mihi.
- Colour variable. Setaceous production of emp. app. normally long. Mucro  
with dorsal triangular lobe of outer lamella not so large and tuberculation  
of Abd. V—VI normal ... ..... *armatus* Tullb.
3. Colour uniformly dark blue. Ant. III—IV with eversible sac AH about  
0.7 times as long as claw III ..... *longispinus* Tullb.
- Colour otherwise. Ant. III—IV apparently without eversible sac. AH ex-  
ceptionally long and strong, 1.3 to 1.45 times as long as the broad, strong  
claw III. Abdomen V dorsally with a postero-marginal median trans-  
versely elliptical rounded swelling ..... *gibbosus* sp.n.

*Achorutes scoticus* Carp. & Evans.

*Achorutes longispinus* var. *scoticus* Carpenter & Evans, 1899, Proc.  
R. Phys. Soc. Edin., XIV, p. 254, Pl. V, fig. 7; Pl. VIII, figs.  
15-18; *A. armatus* var. *cuspidata* Axelson, 1905, Zool. Anz.,  
XXVIII, No. 24/25, p. 788; *A. filiformis* Wahlgren, 1906, Ent.  
Tidskr., Årg. 27, 4, p. 221, fig. 1.

Originally described from Bavelaw Moss (Midlothian) from wet  
Sphagnum, where I have since taken it in numbers, as well as from  
other localities, *always inhabiting wet Sphagnum*. It is more closely  
related to *armatus* than to *longispinus* and is sharply characterised  
by the exceptionally long filiform empodial appendage. It is, in fact,  
the form described by Axelson under the name *cuspidata* and also  
the *filiformis* of Wahlgren.

Length 0.9—1.4 mm. Colour dark bluish-grey to bluish-black. Inner margin  
of claw with fine median tooth; *two pairs of lateral teeth*, i.e. a sub-basal pair  
and a sub-distal pair, the latter situated in the distal 0.25—0.3 or thereabouts.  
*Setaceous production of emp. app. unusually long*, at least attaining apex of  
claw; filiform. Ant. III—IV with eversible sac. AH long, strong, carried erect;  
longer than claw III and placed on tuberculate papillae, which are about one-  
third the length of the AH and contiguous at base. Mucro c. 0.5 as long as  
the dentes (which are approximately as long as claw III), apically rounded;  
triangular dorsal lobe of outer lamella *larger* than in *armatus*. Infra-anal lobes  
much as in *armatus*; Abd. VI with raised, strongly tuberculate areas flanking  
the anal papillae and particularly conspicuous below and above the papillae when  
viewed laterally; Abd. V with a raised dorsal band, broadest medianly, narrow-  
ing laterally and similarly strongly tuberculate; Abd. IV with a median and two  
smaller and less strongly tuberculated lateral areas.

SCOTLAND: EDINBURGH, Bavelaw Moss, near Balerno (Evans, 1899), not uncommon in wet Sphagnum, ix.24; PERTSHIRE, Ben More, 3,500ft., ix.25. ENGLAND: NORTHUMBERLAND, Wooler, vi.12, and Blanchland Moor, vi.39; DURHAM, Chapel Fell, St. John's Chapel, 22.vi.10, and from near Stanhope, vi.39; YORKS, Ravenscar, ix.10; CHESHIRE, Lindow Common, near Wilmslow, in large numbers from wet Sphagnum in a peat bog, 17-19.viii. 39.

Previously known from Finnish and Swedish Lapland.

### ***Achorutes gibbosus* sp.n.**

Length 1.0—1.3 mm. Yellowish with grey to greyish-brown dorsal markings—one example dorsally entirely dark grey including antennae—underside and legs always pale; eye-patches black. Ant. III—IV *without eversible sac* (twenty-four examined). PAO in triangular depression with four peripheral vesicles, the upper pair elongated and wing-like as in *Schafferia*. Claws stout, III c. 0.7 to 0.75 times as long as AH, inner margin with strong tooth at about basal 0.4 which is over-reached by the setaceous prolongation of the emp. app. I have not been able to distinguish lateral teeth. AH *exceptionally long*, strong, curved and carried erect; situated on large papillae which are separated basally; 1.3 to 1.45 times as long as hind claw and 2.5 times as long as the papillae. Integument strongly granulate, posterior body segments dorsally tuberculate; V *with a characteristic postero-median transverse elliptic rounded swelling* occupying 0.2—0.25 the breadth of the tuberculated area. The longer dorsal bristles long, strong and straight, those of Abd. II 1.5 times as long as hind claw; the longest bristles of Abd. V and VI 1.6 to 1.7 times as long as the AH. Mucro 0.5 the length of dentes, apically rounded, but details of the lamellae difficult to describe with accuracy from the available material. AH straight in very small, young specimens.

The species comes nearest to *A. longispinus* and is readily distinguished by the italicised characters. A North American species, *A. pseudarmatus* Fols., falls in this section of the genus and agrees with *gibbosus* in the absence of the eversible sac of Ant. III-IV, but in that species the AH are shorter than the hind claw, the mucro and dentes are distinctive and the infra-anal lobes are large.

SCOTLAND: ARGYLL and DUMBARTONSHIRE, at the head of L. Long, near Ardlui, 4.viii.35; EDINBURGH, Corstorphine Hill, iv.35. ENGLAND: NORTHUMBERLAND, Benton, several from under stones, xii.36, and Cullercoats, iv.39; DURHAM, Axwell Park, in a manure heap with *A. sahlbergi*, 1908; E. YORKS, Bridlington, several small young examples, vii.39; LANCs., Manchester, 14.iv.40; CHESHIRE, Lymm, from cabbage root (type), xi.34 (*Britten*). IRELAND: Co. Down, Belfast, from under bark of a conifer, several, iv.38 (*J. Litster*).

*Achorutes bengtssoni* Agren.

Jackson has recorded this species from Hertfordshire and Cam-

bridgeshire, and his are, to the best of my knowledge, the only British records. It may, however, prove to be a common enough species with us. I have recently taken it in DURHAM, Low Fell, plentiful in a heap of cut grass, viii.39, and LANCS., Manchester, from débris in an overrun waste garden, 14.iv.40. I think I have already recorded it from the shore at the head of Loch Long in 1912, and I now find that I took it in some plenty in moles' nests as follows:—NORTHUMBERLAND, on the Irthing near Naworth, 1910, and DURHAM, Bradbury, several (with a few examples of *A. armatus*), 1910, and Fatfield, iii.1911.

*Achorutes manubrialis* Tullb.

DURHAM, Sunderland, in numbers, 1910. I have no further data.

*Achorutes sahlbergi* Reut.

This species comes near *vernalis* Carl, though it is substantially larger and differs in several details. I hope to secure specimens with a view to studying the species.

DURHAM, Axwell Park, in a manure heap, autumn, 1908. SCOTLAND, amongst rotting seaweed at Stranraer, Tighnibruaich and in the Kyles of Bute, vii.1907. First British records.

*Achorutes viaticus* Tullb.

The following are some coast records:—HEBRIDES, Gallanach, Muck, under dead weed at and below high-water mark, common, 5-8.viii.39 (*Prof. Hobson*); LINLITHGOW and EDINBURGH, shore between S. Queensferry and Grantown, ii.35 onwards; FIFE, Torrieburn, 16.vii.37; ARRAN, in large numbers on sandy sea-shore at Kildonan, 19.iv.35 (*Prof. King*); DURHAM, coast at Roker, near Sunderland, 1910; IRELAND: CO. DOWN, Strangford Lough, Kircubbin, 7.v.39 (*J. Litster*).

*Achorutes browni* sp.n.

This species falls in the *purpurascens* group (as understood by Womersley), wherein the tenent hairs are arranged in a transverse line each the same distance from the apex of the tibiotarsus. It comes nearest to *A. macgillivrayi* Folsom, a North American species, and is separated from all species of the group known to me by the nature of the tenent hairs.

Length c. 1.3 mm. Colour of a uniform deep bluish-black, legs and furca not so dark. As in *macgillivrayi*, the AH are only c. 0.25 the length of the hind claw and are placed on low, broad-seated papillae. It differs from that species in that the short, blunt sense-rods of antennal organ III are situated in pits

and are closer together, whilst the protective external sensory rods are slightly curved and subequal in length. The tenent hairs, which are lightly knobbed, number 2 : 3 : 3. The species is peculiar in that (1) the median tenent hair is not only longer *but substantially stouter than the others, which are exceptionally fine*, and (2) in tibiotarsus III the series of three bristles situated about middle and directly above the three tenent hairs is characterised by the median one being long and fine, *equal in length and fineness to the outer tenent hairs and, like them, knobbed at apex*.

The mucro is of the *purpurascens* type, slender, notched just before apex, and c. 0.3 the length of dentes; the long sub-basal dorsal bristle of dentes is stiff, straight and unusually long, being 0.6 the length of dentes and substantially as figured by Handschin (1929) for *purpurascens*. Integument finely granular, dorsal body setae short and slightly curved. Setaceous prolongation of emp. app. reaching the tooth of inner margin of claw.

NORTHUMBERLAND, Jesmond Dene, Newcastle-on-Tyne, a colony found under partially submerged (and occasionally submerged) stones with *Aphoromma thalassophila* Bagn., 19.viii.39.

I have pleasure in dedicating this species to the well-known Collembolist, J. Meikle Brown.

The following two species belong to the *pseudopurpurascens*-group, wherein the tenent hairs are *not* placed in a transverse line:—

TABLE OF THE BRITISH SPECIES OF THE *PSEUDOPURPURASCENS*  
GROUP OF THE GENUS *ACHORUTES*.

1. Tenent hairs 3 : 3 : 3 equally disposed as to a median distal one and a pair of subdistal lateral ones. Setaceous prolongation of empodial appendage scarcely attaining inner marginal tooth of claw. Length 1.7 mm.  
..... *pseudopurpurascens* Wom.
- Tenent hairs otherwise, only those of II as in *pseudopurpurascens* Wom. Setaceous prolongation of empodial appendage reaching beyond inner marginal tooth of claw ..... 2.
2. Size larger (2.5—2.8 mm.). Tenent hairs 2 : 3 : 3, those of III unequally disposed, a distal and subdistal hair somewhat close together and set obliquely, the third yet more remote from the apex of the tibiotarsus and further from the others than they are from each other .... *burkilli* sp.n.
- Size smaller (1.5—1.6 mm.). Tenent hairs 2 : 3 : 2, arranged as in *pseudopurpurascens* except that one of the lateral subdistal ones of I and III is absent ..... *britannicus* sp.n.

***Achorutes burkilli* sp.n.**

Length 2.5—2.8 mm. Colour brownish with a violet tinge and darkly mottled with bluish-black. Eye-patches dead black and an exceptionally dark antero-median patch on forehead. Antennae bluish-grey to greyish-black, about as long as the head; III with two short sense-rods each in a pit, these pits being well separated. Apart from its appreciably greater size, this species differs from *pseudopurpurascens* and *britannicus* by the number and arrangement of the tibio-tarsal tenent hairs, which number 2 : 3 : 3. Those of I are as in *britannicus*, and II as in both *pseudopurpurascens* and *britannicus*; those of III,

whilst agreeing with *pseudopurpurascens* in number, are arranged characteristically—a couple close together, placed obliquely, and a third at a greater distance from the apex of the tibio-tarsus and further from the others than they are from each other. The anal papillae are broadly seated and contiguous and the AH usually curved (though occasionally straight), stout and about twice as long as its lateral breadth at base. Dentes about as long as the manubrium and the mucro (typical of the group) 0.36—0.4 the length of dentes. Body bristles relatively longer than in *pseudopurpurascens* and *britannicus*; the longest of second dorsal row of Abd. II about 0.75 times as long as the hind claw, and those of VI c. 1.2 times as long. Inner marginal tooth of claw situated at about the distal 0.4; a pair of sub-basal lateral teeth at or near the basal 0.3. Emp. app. with elongated lamina, those of III one-third as long as the inner margin of claw and twice as long as broad; the setaceous prolongation as long as or slightly longer than the laminate part and slightly over-reaching the inner marginal tooth of claw.

This exceptionally large species has only been found in the woodlands of the Thames area and is gladly dedicated to H. J. Burkill, M.A., in appreciation of his labours in many fields of Natural History over a long period. Mr. Burkill was with me when the Effingham discovery was made.

SURREY, Effingham, by beating dead elder branches, in numbers, type and paratypes, vi.34; Box Hill, dead branches, viii.39; KENT, Tenterton, on a dead log, v.39; Wye and Leeds Castle, under bark of elder, 29.iii.21; ESSEX, Epping Forest, various dates; and HERTS, near Welwyn, 1.iv.21.

### ***Achorutes britannicus* sp.n.**

This species is separated from *A. pseudopurpurascens* (Wom.) by the longer setaceous production of the empodial appendage and the formula of the tenent hairs, which number 2:3:2, arranged as in that species, but one of the sub-distal laterals absent in I and III.

Length 1.5—1.6 mm. Colour usually pale, ashey-grey to yellowish, more or less considerably pigmented with dark grey to grey-black, rarely with a bluish tinge; eye-patches black. Some examples evenly pigmented, others mottled; specimens from caves only lightly pigmented.

Antennae about as long as the head, without eversible sac; relative lengths (and breadths) of segments I, II and III+IV respectively: 30 (42): 35 (35): 80 (32). Sensory organ on III composed of two short, blunt sensory rods each in a pit-like depression (these depressions contiguous or sub-contiguous) supported by a pair of outer bent and pointed sense-rods; IV with terminal retractile knob and several slender sense-rods of varying lengths and not readily distinguishable from the bristles; bristles long, the longest on IV c. 0.7 as long as the breadth of the joint. Ommatidia 8+8; PAO composed of four vesicles arranged round a central boss. Claw stout, at least 0.37 as broad as its outer length; furnished with a pair of sub-basal lateral teeth and the inner margin toothed at about its distal 0.4; emp. app. strongly laminate for 0.5 its length, the lamina broadest distally, thence bristle-like and reaching to slightly beyond

the inner tooth of claw. Tenent hairs knobbed, stepped and numbering 2 : 3 : 2, as long as or slightly longer than the claw. AH on subcontiguous papillae, equal in length to the papillae, about 2.6 times as long as basally broad and 0.5 the length of the hind foot. Integument finely granular; setae short but longer and stronger apically, those on Abd. tergite II c. 0.6—0.7 and on III 0.8 to 1.0 the length of hind claw. Furca much as described for *purpurascens*, mucro about 0.28—0.3 the length of dentes.

KENT, Chislehurst Caves, in numbers (type and paratypes), viii.38 (*J. Litster*); Mottingham, viii.38 (*J. Litster*), and Tenterton, amongst dead leaves, v.39; ESSEX, Chingford, under bark of oak, vi.34; SURREY, Box Hill, general, viii.35, and by beating ash, viii.38; E. YORKS, Sewerby, under log, vii.39; DURHAM, Gibside, under bark of beech, 3.ix.10, and of birch, ix.35. SCOTLAND: EDINBURGH, Roslin, under bark of elm, iv.37, and from an Edinburgh garden, iv.35; Ayrshire, Ayr, garden, 1910. Also from N. Ireland and Eire (*J. Litster*).

*Polycanthella acuminata* Den.

The following are the first Irish records of this interesting halophile, recently brought forward as British from specimens found on the Dorset and Essex littoral:—

EIRE: DUBLIN, Skerrie, in numbers, 30.vii.39, and MEATH, estuary of the R. Nanny, Laytown, viii.39 (*J. Litster*).

*Aphoromma thalassophila* Bagn.

Since describing this halophile from numerous British localities I have received it from the coast of several counties of EIRE and have made further observations myself. Whilst it is essentially an intertidal coastal species, I have already included a record from the banks of the Tyne at Gateshead, where the river is tidal, and I have since noted it on the Newcastle banks as well (viii.39). During July, 1939, whilst searching for *Anurida crassicornis* Reut. (*tullbergi* Schött) on the banks of the Thames (when uncovered by the tide) between Putney and Richmond, this species also occurred on both sides of the river. In August, I found a colony living under stones submerged by the stream at Jesmond Dene, Newcastle, where it flows at a considerable height above the level of the sea, so we must rank the species as both littoral and riparian.

*Anurida denisi* Bagn.

Though this species so long evaded detection, it is evidently widely distributed. Litster has now sent it to me from the counties of LOUTH, DUBLIN and CORK, whilst in addition to the DURHAM and S. DEVON records already published I find I have five specimens taken at Thornwick Bay, near Flamborough, E. YORKS, ix.34.

Genus *Neanura* MacGillivray.

This is the *Achorutes* of Börner and recent European authors who, I think, have too readily followed Börner. Since Templeton described the common species, *muscorum*, more than a century ago, no other species has, up to now, been brought to light in the British Isles, so that it is with exceptional pleasure that I now put on record two further species of the genus from S. Devon, both of which were collected by Litster. They are both small white species falling into a section of the genus remote from *muscorum* in that they have only  $2+2$  ommatidia instead of  $3+3$ , whilst Abd. VI is hidden and there are no prominent lobes at the end of the body.

*Neanura grassei* (Den.).

*Achorutes grassei* Denis, 1923, Ann. Soc. Ent. Fr., **92**, p. 237, figs. 34-37.

This species falls to No. 15 in Denis's table, 1933 (Boll. Lab. Zool. R. Inst. sup. agr. Portici, XXVII, p. 229), having the characters already indicated, to which may be added:—

(1) The central antero-median and the ocular tuberculate areas of the head are coalesced; (2) the mid-dorsal pair of Abd. IV are united medianly; and (3) those of V are coalesced into a single mass. The bristles are normally long and smooth and the claw is without an inner marginal tooth.

The species, superficially, is extraordinarily like *N. ornata* Fols. (Alaska and Siberia), but that species possesses  $3+3$  ommatidia, though, as in *grassei*, the antero-median and ocular tuberculate areas of head, the mid-dorsal of Abd. IV and those of V are similarly massed and coalesced. The claw of *ornata* is furnished with a sub-basal tooth within.

S. DEVON, Torquay, amongst dead leaves in wood, two examples only, v.37 (*J. Litster*). Previously known from S. France.

*Neanura hystrix* sp.n.

Length c. 1.4 mm. White with ommatidia pigmented. Related to *grassei* and, as in that species, having  $2+2$  ommatidia; Abd. VI hidden and the antero-median and ocular tuberculate areas of head massed and coalesced. The four postero-median tubercles of head are united to form two larger oblong areas each carrying two very long bristles. The mid-lateral pair of dorsal tuberculate areas of Abd. IV apparently touch, though they are not closely united, whilst those of V also touch but can scarcely be said to form a compact mass as in *grassei* and *ornata*. The bristles are smooth, slender, strongly curved and *exceptionally* long, reaching over and beyond the segment anterior to the segment of their origin; for instance, the four dorsal bristles of Abd. I and II reach beyond the basal parts of III and IV respectively, whilst those on III reach beyond the apex of the abdomen. The claw is furnished with a sub-basal tooth within.

S. DEVON, Dartmouth Castle gardens, 29.v.37, one example only (*J. Litster*).

***Proisotoma sphagneticola* sp.n.**

Near *P. crassicauda* (Tullb.).

Length 0.45—0.65 mm. Colour deep blue to bluish-black, ommatidia on black patches. Hypodermal pigmentation very strong and tenacious, turning purple after treatment with KOH. Form short and stout and body setae minute as in *crassicauda*. Antennae stout, approximately as long as head; relative lengths (and breadths) of joints approximately: 8 (11): 10 (9.5): 12 (11): 21 (12); sense organ on III apparently typical; IV ovate, without sensory rods but with apical and subapical papillae. Ommatidia 8+8, subequal; PAO elliptical and about as long as twice the diameter of one of the ommatidia; periphery double. Legs stout; tibiotarsus without tenent hairs, but with a long preapical bristle; claw apparently not toothed, III about 1.4 times as long as the mucro; hind tibia not much less stout than the dentes. Furca with the dentes stouter than the tibiae, reaching across sternite II or thereabouts. Manubrium slightly longer than dentes; mucro as described for *crassicauda*, but longer in relation to the length of the dentes, the relative lengths of manubrium, dentes and mucro being approximately 40:36:10-11. Ventral surface of manubrium with a pair of minute setae which, in addition to being very weak, are widely spaced and set well back from the distal margin. Rami of tenaculum quadridentate; corpus apparently without setae (but of this I cannot speak with certainty). Relative length of body segments Th. II to Abd. VI: c. 60:43:35:33:36:50:32:24. Integument minutely tuberculate (determined from part of the head of one example only).

This species can only be compared with *crassicauda* and may be distinguished by its colour (blackish-violet in *crassicauda*), its minuteness, being less than one-half the size, and its relatively larger mucro, which is c. 0.35 the length of the dentes, compared with 0.16-0.2 in *crassicauda*. My specimens have been so resistant to treatment that I have not yet secured properly cleared preparations. I think, however, that further study will show that both *sphagneticola* and *crassicauda* should be referred to the genus *Guthriella* Börner.

CHESHIRE, Lindow Common, Wilmslow, 17-19.vii.39, in numbers in wet Sphagnum from a peat-bog.

***Parisotoma* gen.n.**

This genus is proposed for the species, now included in *Isotoma*, in which the number of ommatidia is less than the normal and the usual sensory rods of Ant. IV are present.

Near *Isotoma*. Species usually small (0.7—1.1 mm.). Ant. IV furnished with sensory rods. PAO present. Ommatidia 6+6 or fewer, rarely absent. Ventral surface of manubrium strongly setose; mucro 2—4 dentate.

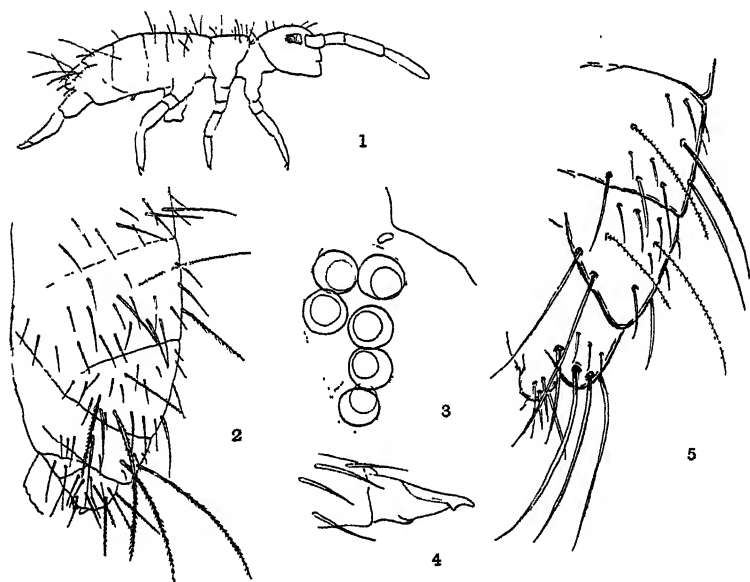
GENOTYPE: *Isotoma notabilis* Schöff.



The British species are *tenuicornis* (Axels.), *notabilis* (Schäff.), *delicatula* (Brown), *bipunctata* (Axels.), and *sphagneticola* (Axels.).

The genera may be separated by the following key:—

1. Ommatidia 8+8; PAO present; Ant. IV without sensory rods; ventral surface of manubrium strongly setose ..... *Isotoma* s.str.
- Ommatidia 6+6, fewer or absent; PAO present or absent; Ant. IV with sensory rods or cones. Species small ..... 2.
2. Ommatidia 6+6 or fewer, rarely absent. PAO present. Ant. IV with normal sensory rods. Ventral surface of manubrium strongly setose.  
..... *Parisotoma* nov.
- Ommatidia and PAO absent. Ant. IV with several exceptionally stout sense-cones. Ventral surface of manubrium naked except for 5+5 or fewer subdistal setae ..... *Isotomiella* Bagn.



FIGS. 1-4.—*Architomocerura crassicauda* Den. 1, Outline; 2, end of abdomen; 3, ommatidia and PAO; 4, mucro and end of denticles. FIG. 5.—*A. litsteriana* sp.n., end of abdomen. (Figs. 1-4 after Denis.)

#### Genus *Architomocerura* Den.

In describing a second species of this genus I am able to formulate objections to its retention in the *Isotomidae*. In the species now diagnosed there are two new characters—the long Ant. III as compared with IV and the presence of a tenent hair which, having

a dilated tip, makes it inappropriate to link the genus with the *Isotomidae*, and, in association with other characters, brings it into, or near, the *Tomoceridae*. The annulate joints III-IV of the antennae, the six ommatidia, the structure of the tenent hair when present and the form of the terminal abdominal segments are to be seen in *Tomocerus*, and it does not entail any great imagination to see in the peculiar form of the mucro a stage in the development of the characteristic mucro of *Tomocerus*. The abdominal chaetotaxy also supports this association, as the macro-setae and bothriotrichae found in *Architomocera litsteriana* and figured herein (fig. 5) are to be seen in young examples of *Tomocerus*—the three postero-medial (i.e. unpaired) macro-setae of Abd. V being very characteristic and, of course, quite foreign to any *Isotomid*.

This combination of characters justifies placing the genus in or near the *Tomoceridae*, and an examination of the mouth-parts when further material becomes available will, I hope, help us finally to settle this question.

The known species (both of which are members of the British fauna) may be tabulated as under:—

1. Ant. III shorter than IV; foot without tenent hair; macro-setae of Abd. III—VI ciliated or 'feathered' (Fig. 2) ..... *A. crassicauda* Den.
- Ant. III noticeably longer than IV; tenent hair present, straight and apically dilated; macro-setae of Abd. III—VI simple, smooth (Fig. 5).  
..... *A. litsteriana* sp.n.

### ***Architomocera litsteriana* sp.n.**

Much as in *A. crassicauda* in size and form.

Colour glistening white, base of antenna and basal part of legs lightly tinged with violet, and Ant. III and IV violet. Eye-patches deep bluish-black. Antenna more slender than in *crassicauda*, III and IV cylindrical, annulate, and III noticeably longer than IV, the relative lengths of the joints being 20:30:100:87, 20:28:90:75 and ?:30:95:75 in three examples respectively. Abd. III and IV subequal; long, smooth, heavy bristles on III—V, those on V numbering a postero-medial series of three which are about as long as the dentes and are flanked on each side by a shorter one. Bothriotrichae evidently limited to two pairs on Abd. IV (the outer being only 0.6 the length of the inner) and one pair on III which are approximately the length of the longer ones on IV. Foot much as in *crassicauda*; tibiotarsal tenent hair present, straight and with dilated tip. Furca reaching beyond ventral tube; mucro as in *crassicauda* but having the sub-basal tooth stronger than in that species. Relative lengths of manubrium, dentes and mucro approximately 4.5:7.5:1 (4.6:8:1) compared with 3:6:1 in *crassicauda*.

SCOTLAND: EDINBURGH, Boghall, Pentlands, in soil, vi.28 (*Kendall* coll., No. 47a, 9). ENGLAND: DEVON, Torquay, vi.36 (*R.S.B.*); SOMERSET, Cheddar, viii.38 (*J. Litster*); in each case a single example

only. IRELAND: Cave Hill, Belfast, several in moss, 3.xii.38 and 17.iii.39 (*J. Litster*).

I am particularly pleased to dedicate the species to J. Litster in recognition of his phenomenal successes in making so many important discoveries.

3 St. Helen's Terrace,  
Low Fell, Gateshead-on-Tyne.  
April 28th, 1940.

NEURIGONA ABDOMINALIS FLN. TAKEN IN HERTS. AND A KEY TO THE BRITISH SPECIES OF NEURIGONA (DIPT., DOLICHOPODIDAE).

BY L. PARMENTER, F.R.E.S.

On 12th June, 1940, Dr. F. W. Edwards captured a male *Neurigona* on a window of his house at Letchworth which seemed different from both *quadrifasciata* Fab. and *suturalis* Fln. He very kindly allowed me to examine it and I found it to be a specimen of *abdominalis* Fln. It has been added to the collection of the British Museum (Nat. Hist.).

As far as I am aware it has only once previously been taken in this country when on June 13th, 1926, Mr. J. E. Collin took a male at Kirtling, Cambs. In adding this species to the British list Collin (1927, *Proc. ent. Soc. Lond.*, 2:19) drew attention to the ornamentation of the front tarsus, a point overlooked by Lundbeck (1912, *Diptera Danica*, 4:45-6) who, however, otherwise gives a good description in English.

KEY TO BRITISH SPECIES OF NEURIGONA.

- 1 (2) Thorax yellow in both sexes, abdomen unbanded ..... *pallida* Fln.
- 2 (1) Thorax grey in both sexes or if yellow in ♀ then with a grey spot at base, abdomen banded ..... 3
- 3 (4) Thorax in ♀ yellow with a grey spot at base, ♂ with 3rd and 4th tarsal segments of front leg black plumed ..... *quadrifasciata* Fab.
- 4 (3) Thorax grey in both sexes ..... 5
- 5 (6) Wing darkened along front margin, apical section of discal vein almost straight, posterior crossvein noticeably nearer apex than base of wing, scutellum yellow with grey base, front tarsi of ♂ not ornamented.  
..... *suturalis* Fln.
- 6 (5) Wing not darkened along front margin, apical section of discal vein distinctly curved, posterior crossvein near middle of wing, scutellum yellow, ♂ with 5th tarsal segment of front leg with a brush of short black hairs ..... *abdominalis* Fln.

94 Fairlands Avenue,  
Thornton Heath,  
Surrey.  
June 22nd, 1940.

## TWO NEW WEST INDIAN CURCULIONIDAE (COL.).

BY SIR GUY A. K. MARSHALL, C.M.G., D.SC., F.R.S.

The two new weevils described below were contained in a small collection of beetles forwarded for identification by Mr. R. G. Fennah, who has been working on various entomological problems in the British West Indies. Hardly anything is known of the Coleoptera of Dominica and St. Lucia, and it therefore seems desirable to record them. The type material will be deposited in the British Museum (Nat. Hist.).

## Subfamily HYLOBIINAE.

**Nannilipus** gen.n.

*Head* globular, squamose; forehead much narrower than the base of the rostrum and continuous with it. *Rostrum* shorter than the pronotum, similar in the two sexes; scrobes oblique, unusually short, extending only a little behind the middle of the rostrum. *Antennae* with the funicle 7-jointed; club separated from the funicle, pubescent, with the two basal joints subequal. *Prothorax* subglobose, bisinuate at the base, obliquely truncate laterally at the apex, without any trace of postocular lobes. *Scutellum* small but distinct. *Elytra* oblong-ovate, with prominent roundly-rectangular shoulders, obtusely acuminate and jointly rounded at the apex, without any subapical callus, and with ten complete striae. *Legs* with the femora strongly clavate, unarmed; tibiae incurved at the apex, strongly uncinat, with a sharp mucro on the anterior pairs, the hind pair with the corbels not ascending the dorsal edge; tarsi with joint 4 rather short, the claws divaricate. *Underside* with the prosternum not sulcate, its front margin not sinuate, the coxae contiguous; metasternum as long as a middle coxa; ventrite 2 longer than 3+4, the first sutures straight and not fused in the middle.

GENOTYPE: *Nannilipus fennahi*, sp.n.

A distinct genus coming nearest to *Dorytomorpha* Hust., 1929, from Guadeloupe, which differs in having the femora dentate, the front coxae separated, the anterior margin of the prosternum sinuate, and the hind margin of the pronotum truncate.

**Nannilipus fennahi** sp.n.

♂ ♀. Derm pale red-brown, with dense scaling which varies from grey to yellowish; pronotum with a broad median brown stripe, and sometimes a small brown spot on each side of it before the middle, but these markings usually more or less suffused with grey scales; elytra with two very variable irregular common brown patches, one on the basal half, the other at or behind the middle, extending laterally to stria 3 or 4, often united along the suture and usually more or less suffused with paler scales, the basal one always including a short pale stripe at the base of the suture; underside with dense grey scaling on the sternum, the venter dark red-brown to blackish on the two basal ventrites, the remainder testaceous.

*Head* with the uniform dense pale scaling entirely concealing the sculpture. *Rostrum* of ♂ stout, only slightly dilated at the apex, smooth and densely squamose up to the antennae, the apical portion bare, shiny, with fairly close shallow punctures; rostrum of ♀ a little more slender and more dilated at the apex. *Antennae* with the scape reaching the hind margin of the eye, its apex shortly and abruptly clavate; funicle slightly dilated distally, the two basal joints subequal, 3 and 4 as long as broad, 5-7 transverse. *Prothorax* about as long as broad, strongly rounded laterally, widest at the middle, not constricted at the apex, which is two-thirds the width of the base; the dorsum convex longitudinally, highest behind the middle, smooth, the dense fine punctuation entirely hidden by scaling, the intervals bearing minute granules, with very fine short erect setae in ♀, the setae in ♂ minute and recumbent. *Scutellum* punctiform, densely squamose. *Elytra* with the sides very shallowly sinuate behind the prominent shoulders; the shallow striae visible only as fine lines among the pale scales, with a minute granule between the indistinct punctures; the intervals, when bare, shiny and very finely rugulose; the pale areas with large rounded overlapping scales (much larger than those on the pronotum), which are slightly concave with a small central boss, the clothing on the dark areas amorphous; the setae minute, recumbent. *Legs* testaceous, with more or less dense scaling; femora of ♂ very stout, strongly clavate, convex on the lower edge; femora of ♀ much more slender, almost straight on the lower edge; tibiae with minute denticles on the lower edge. *Venter* with the intercoxal process as broad as a coxa and gently arcuate; ventrites 1, 2, 5 of ♂ broadly concave, those of ♀ convex.

Length 2.0-2.5 mm., breadth 0.9-1.0 mm.

DOMINICA: Morne Anglais, 3,000 ft., 8 ♂, 3 ♀, on leaves of *Heliconia* sp., i. 1940 (R. G. Fennah).

#### Subfamily BARIDINAE.

#### ***Cyrionyx piperis* sp.n.**

♂ ♀. Derm dark brown to blackish-brown, with the following markings formed of white scales: prothorax with a narrow ill-defined median stripe and a macular sublateral stripe on each side, elytra with an indefinite basal band on intervals 4-7, an elongate spot on 2 at about one-fourth from base, slightly behind this a transverse band on 6-10, immediately behind this an elongate patch on 5, a transverse patch at the top of the declivity on 2-5, and a small diffuse subapical patch; underside with dense white scaling on the prosternum, the median parts of the mesosternum and on the metepisterna, the scaling more sparse elsewhere.

*Head* bare on the vertex, the forehead with dense white scaling. *Rostrum* similar in the two sexes (except that the diffuse whitish scaling extends to the antennae in ♂), rather slender, subcylindrical, forming a regular curve with the forehead, of equal depth in profile from the base to the antennae (at one-fourth from the apex); the dorsal area almost impunctate in ♀ except in the basal fourth and not striate. *Prothorax* transverse, rounded laterally, widest behind the middle, with a collar-like apical constriction which is continued across the dorsum, the base very shallowly bisinuate, the apical margin slightly arcuate; the dorsum convex longitudinally, with dense small shallow confluent punctuation,

the intervals minutely granulate. *Scutellum* semi-circular, dull, impunctate, almost bare. *Elytra* subtriangular, widest at the broadly rounded shoulders, narrowing from there with a slight curve to the apex; the deep narrow striae with obsolescent punctures, the intervals broader than the striae, convex, rugulose, with numerous short appressed brown setae, the white scales triangular and broadly truncate at the apex. *Legs* red-brown, with the tibiae and the base of the femora flavescent; femora with a small sharp tooth, tibiae not curved at the base, tarsal claws small and free. *Sternum* with the front coxae contiguous, the prosternal furrow shallow.

Length 1.5—1.9 mm., breadth 0.7—0.9 mm.

ST. LUCIA: Quillesse, 1,000 ft., 51♂, 15♀, on *Piper* sp. in forest, xi.1939 (*R. G. Fennah*).

Extremely close in facies and colouring to *C. alboplagiatus* Champ. (1907, Biol. Cent. Amer., Col. 4, pt. 5, pl. xi, fig. 30), of which only a single female specimen is known, from Guatemala. This female has the rostrum (viewed in profile) rapidly narrowed from the base to the antennae, its dorsal outline being bent at a short distance from the base; the rostrum is also punctato-striate and squamose from the base to the antennae, which are inserted at the middle; the tibiae are curved at the base.

Imperial Institute of Entomology,  
British Museum (Nat. Hist.),  
London, S.W.7.

June 27th, 1940.

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*Coleoptera at Skenfrith, Monmouthshire.*—It may be of interest to record the capture of *Molorchus umbellatarum* Schreiber at Skenfrith. I was fortunate enough to obtain two specimens last month, and it is quite possible that, had I been collecting earlier while the hawthorn was about, I might have obtained a series. Another Longicorn which has fallen to my lot this year is *Leptura cerambyciformis* Schrank; this species occurs in fair numbers in this district, both in Herefordshire and over the Monmouthshire border. I only had the opportunity to do a few days collecting last month, but since, so far as I know, there are no published records of beetles for this immediate neighbourhood I append a list of the less common or more local species, all of which I took within a few miles of St. Weonards:—*Amara ovata* F., *Bembidion tibiale* Duft., *Anthrenus fuscus* Oliv., *Attagenus pelli* L., *Byrrhus pilula* L., *Endomychus coccineus* L., *Myrrha* 18-guttata L., *Throscus dermestoides* L. (this species was very common one evening at the end of May last year; the beetles were to be found on some patches of bare earth at the entrance to rabbit burrows on the bank of a stream, but they were confined to a space of two or three yards; within this small area the beetles were continually arriving and settling on the ground), *Melasis buprestoides* L., *Denticollis linearis* L., *Helodes minuta* L., *H. marginata* F., *Corynetes coeruleus* De G., *Clytus arietis* L., *Anaglyptus mysticus* L., *Strangalia maculata* Poda, *Haltica lythri* Aubé, *Vincensellus viridipennis* Latr., *Mordellistena abdominalis* F., *Apion punctigerum* Payk., *Liophloeus tessulatus* Müller, *Barynotus obscurus* F., *Acalles turbatus* Boheman, *Ceuthorhynchus nasturtii* Germar.—R. W. LLOYD, Treago Castle, St. Weonards, Hereford: July 11th, 1940.

A NOTE ON CERTAIN STRUCTURAL DISTINCTIONS BETWEEN THE  
FEMALES OF *THERIOPECTES TROPICUS* L., *SOLSTITIALIS* Mg.,  
AND *DISTINGUENDUS* VERR. (DIPT., TABANIDAE).

BY J. E. COLLIN, F.R.E.S., ETC.

The females of these three species of *Theriopectes* are distinguished from the other British species of the genus by having (1) the basal sides of abdomen broadly reddish or orange-coloured up to at least the end of third tergite, (2) palpi not narrow as in *montanus*, and (3) frons between base of antennae and point where eyes cease to approximate not polished as in *luridus*. Austen in 'British blood-sucking Flies,' 1906, recognised only one British species which he called '*solstitialis* Schin., Brauer, ?Mg.' Verrall in 1909 added a new species *distinguendus* and proved that our *solstitialis* was Meigen's species, and Goffe in 1931 accepted these two though evidently puzzled by some intermediate forms. In 1932 (*Ent. Rec.*, 44:38) I pointed out that there was a third British species of this group—the true *tropicus* L.—and these three are quoted as British in a recent (1939) revised edition of 'British blood-sucking Flies,' though with the statement that Austen (who was then unaware of the third British species) had stated emphatically in his MS. notes that *distinguendus* and *solstitialis* were inseparable.

About the time when Goffe's work appeared I had become so dissatisfied with unsuccessful attempts to find external characters which would satisfactorily distinguish Tabanid females such as these, that I started to examine the female reproductive organs, and quickly found that the shape of the 8th sternite (in dried specimens usually completely hidden beneath the 7th sternite) and of the anal lamellae or 'cerci' afforded unfailing distinctions in the case of our three red-bodied species quoted above. A difficulty then arose as to the best means of illustrating these differences. It appeared obvious that photography was the method to adopt, but the first attempts were far from satisfactory; finally Dr. F. W. Edwards of the Natural History Museum arranged for the help of Mr. M. G. Sawyers, the Museum photographer, and the excellent photographs here reproduced (Plate II) are his work. I offer my grateful thanks to the Trustees of the British Museum, and the above two gentlemen, for their assistance.

The specific differences in the figures are too obvious to need explanation, but the straight lower (basal) margin of the lateral projections of the sternite in *Th. solstitialis* (Pl. II, fig. 4) should particularly be noted, and allowance made for the slightly damaged



1.



2.



3.



4.



5.



6.

M. G. SAWYERS, photo.]

[To face page 178.

*THERIOPECTES* spp., FEMALE TERMINALIA.

FIGS 1-6.—1, 2, *T. tropicus* L.; 3, 4, *T. solstitialis* Mg.; 5, 6, *T. distinguendus* Verr.; 1, 3, 5, anal lamellae or 'cerci'; 2, 4, 6, eighth sternite





condition of the anal 'cerci' in *Th. distinguendus* (Pl. II, fig. 5). As stated above the 8th sternite is usually hidden in dried specimens, but its terminal part can always be exposed by carefully chipping away the hind margin of the 7th sternite; allowance, however, must be made for the fact that the 8th sternite thus exposed will not be so flattened out as in the figures.

It is interesting to find that while the 8th sternite of *solstitialis* is of very different shape from that of the other two species, it is much more like that of *bisignatus*, a species previously considered only a variety of *tropicus*. It will probably be found that the apparent similarity in these particular parts of the female abdomen in two otherwise different species is not confined to *solstitialis* and *bisignatus*, and the differences may well in some cases be so slight as to require the dissection of long series before one can be certain that they exist, or even be so slight as to be practically valueless, but it is interesting to find that the three British species of *Therio-plectes* with extensive yellow markings on the female abdomen, though otherwise so similar, may be distinguished comparatively easily by these characters.

The figures of *Th. distinguendus* have been made from a topotypical specimen caught at Chippenham Fen (Cams.).

Raylands,

Newmarket.

June 16th, 1940.

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*Dumfriesshire Hemiptera*.—The following species of Hemiptera are recent captures, and are mostly additions to the list of the insect fauna of the county. They are, unless otherwise stated, from the immediate neighbourhood of Gretna. HETEROPTERA:—*Piezodorus lituratus* F., a pair swept from heather on Newton Moss in August; this species is uncommon in this district. *Rhacognathus punctatus* L., I again met with this species on Newton Moss in August when sweeping the heather. *Ischnorhynchus geminatus* Fieb., one specimen of this beautiful little bug was swept on Newton Moss in the evening of July 24th last; it must be very rare with us, as it is the first I have taken in many years collecting. *Stygnocoris fuliginus* Geoffr., another product of Nutberry Moss in October, local and not common. *Gerris gibbifer* Schum., abundant in a peat hole on Newton Moss in May, 1938; last year the hole was full of *Sphagnum* and no *Gerris* was seen. *Nabis limbatus* Dahlb., commonly swept in damp situations. *Microphysa pselaphiformis* Curt., both sexes swept under oak trees at Quentin's Hill, and females only beaten from birch in June. *Miris dolabrata* L., plentiful on rank vegetation in autumn. *Plesiocoris rugicollis* Fall., locally common on sallows. *Phytocoris populi* L., Newton Moss, from oak trees in July, rare. *P. pini* Kbm., a teneral specimen from *Pinus* on Nutberry Moss in August. *Amblytylus brevicollis* Fieb., one swept from long grass on Nutberry Moss in August. Little use was made of the water net, but *Sigara semistriata* Fieb. was secured in peat holes on Newton Moss in September, along with *S. wollastoni* D. & S.; *S. striata* L. was found in a mill stream in May. HOMOPTERA:—I met with *Pediopsis rubi* Boh. in lanes

where brambles grow near Gretna and Eastriggs in August, rare. *Jassus mixtus* F., in an oak wood in August and September; not rare, but restricted in its range. *Agallia venosa* Fln., one near Springfield, rare or passed over for the abundant *A. puncticeps* Germ.; the var. *fulveola* H.S. of *Alebra albostrigella* Fln. occurs with the type form occasionally. *Dicranoura variata* Hardy is fairly common in grassy places; an early species which I have met with on April 26th; early specimens are pale green, but later they become more or less suffused with reddish. *Erythroneura flammigera* Geoffr., by sweeping under trees at Quentin's Hill in August, scarce. *Cixius stigmaticus* Germ., by sweeping on Newton Moss in June, scarce. *Aphalara nebulosa* Zett., Quentin's Hill in June on *Epilobium*; very local, but occurs in abundance in this one locality.—JAS. MURRAY, 6 Burnside Road, Gretna, Dumfriesshire: July 10th, 1940.

*Some Irish Coleoptera records.*—The following Coleoptera are new, rare or local in their distribution in Ireland. It may be necessary to withdraw the name of *Bledius spectabilis* Kraatz, as all the specimens I have seen, or those in collections in Ireland which have been examined, are *limicola* Tott. *Pterostichus cupreus* L. ab. *caesicius* Donis., one specimen taken from under stones at Glenasmole, Co. Dublin, in the spring of 1938; I also have a specimen from Leixlip, Co. Kildare. *Helophorus dorsalis* Marsh., Howth, Co. Dublin, a single example, taken in the Bog o' the Laughs, May, 1930 (det. Prof. Balfour-Browne); previous records are doubtful (cf. Johnston and Halbert, 1902, *Proc. R. Irish Acad.*, (3) 6:61). *Lathrobium fulvipenne* Grav. ab. *letzneri* Gerh., a second Irish specimen swept at 'St. Annes,' Clontarf, Co. Dublin, 23.vi.1940. *Bledius limicola* Tott., all the material standing under *spectabilis* Kraatz in both my own and the national collections appear to be this recently described species; the national collection contains specimens from Belfast, Co. Antrim, Howth, Co. Dublin, Bray, Co. Wicklow, Enniscrone, Co. Sligo, and Mulranny, Co. Mayo; my own material is from Portmarnock and the North Bull, both in North Co. Dublin. *Phyllodrepa puberula* Bernh., another example of this species, which was added to the Irish list last year, was taken from the nest of one of the pigeons breeding about the museum. *Liodes lucens* Fairm., a specimen of this addition to the fauna of Ireland was obtained by Mr. A. W. Stelfox, in August, 1938, on the Murrough, Co. Wicklow. *Cerylon ferrugineum* Steph., in May, 1929, four or five specimens were dug out of a log in Powerscourt Deer park, Co. Wicklow. *Cryptophagus subfumatus* Gyll., a number of specimens from Naas, Co. Kildare, January, 1939, and in tobacco in Dublin (both det. Dr. K. G. Blair). *Ips laricis* Fab., fairly plentiful in poles used as a railing along the lower lake at Glenasmole, Co. Dublin; the poles used here are grown in the glen.—EUGENE O'MAHONY, National Museum of Ireland, Kildare Street, Dublin: July 2nd, 1940.

*Staphylinus parumtomentosus* Stein (Col.), a British Insect.—My friend Mr. Tottenham is perfectly right in asserting (*antea*, p. 129) that it is never safe to say that this or that insect does not occur in Britain. One should of course say 'as far as the writer is aware,' or the like. At the same time it is almost certain that the great majority of records of *S. caesareus* Ced. in this country refer to *S. parumtomentosus* Stein; also my note criticised by Mr. Tottenham was the first and, as far as I am aware, the only mention of the latter species as a British insect. Furthermore, the information given by me was obtained from the late Sainte Claire Deville (the reference to whose note was given by me, but was not mentioned by Mr. Tottenham), Mr. Keys and I having sent British specimens of so-called *S. caesareus* to him at his request.—HORACE DONISTHORPE, British Museum (Nat. Hist.), London, S.W.7: July 8th, 1940.

## NEW SPECIES OF ORIENTAL STAPHYLINIDAE (COL.).

BY MALCOLM CAMERON, M.B., R.N., F.R.E.S.

**Thoracochirus siamensis** sp.n.

Black, the fore-parts rather dull, the abdomen more shining, the posterior margin of the 7th and whole of the 8th tergite red. Antennae and legs dark reddish-brown. Length 11 mm.

This species must be closely allied to *verrucifer* Fauv., but differs in the colour of the abdomen: moreover, the sides of the thorax are furnished with nine or ten crenulations, the anterior margin is not densely crenulate, but has only three or four crenulations in the region of the anterior angles similar to those of the sides, furthermore the large verrucose punctures of the elytra are rather close: in other respects like *verrucifer*.

INDO-CHINA: Laos, Tintoe, 1.xii.19 (*R. V. de Salvaza*). Unique, in my collection.

**Phloeonomus** (s.str.) **tonkinensis** sp.n.

Obscure yellowish-brown, the elytra and abdomen more or less infuscate posteriorly. Antennae black, the first five segments and legs reddish-yellow. Length 2 mm.

Colour of *sumatrensis* Bernh., but a little more shining, the thorax almost impunctate, the elytra much more sparingly and obsoletely punctured. The ground sculpture is rather weaker and the build slightly narrower.

TONKIN: Hoa Binh. Type in my collection.

**Phloeonomus** (s.str.) **obscurellus** sp.n.

Head and thorax dull, black; elytra obscure yellowish-brown, more shining; abdomen black, rather shining. Antennae black, the first two segments yellowish-brown. Legs reddish-yellow. Length 1.75 mm.

Very near *quadrifossulatus* Motsch. (*obscurus* Kr.), but differs in the darker basal joints of the antennae, the longer less transverse thorax with the fossae less deep: the sculpture of the fore-parts scarcely differs from that of *quadrifossulatus*, but the abdomen is much more finely and not roughly punctured: in other respects similar.

TONKIN: Hoa Binh. Type in my collection.

**Trogophloeus** (**Boopinus**) **saigonensis** sp.n.

Moderately shining, black, the elytra and abdomen more shining, the former dark brown, indeterminately lighter towards the posterior margin. Antennae black, the first three segments and legs reddish-yellow. Length 1.5 mm.

Near *simplex* Motsch., but smaller and much narrower, the thorax less transverse, almost straightly narrowed behind. Head with large and prominent eyes as broad as the thorax, bi-impressed in front, strongly coriaceous except in front which is more shining. Antennae shorter than in *simplex*, the 3rd

segment shorter than the 2nd, 4th and 5th about as long as broad, 6th to 10th transverse but not strongly so. Thorax slightly transverse (1.3:1), the sides gently rounded in front, retracted and straighter behind, discal impressions weak, strongly coriaceous without punctures. Elytra longer than the thorax (1.5:1), moderately finely, closely punctured. Abdomen extremely finely, moderately closely punctured, feebly coriaceous and shining.

INDO-CHINA : Saigon. Type in my collection.

**Trogophloeus (Taenosoma) bicolor** sp.n.

Head and abdomen black, the former greasy-lustrous, the latter shining; thorax bright yellowish-red, greasy-lustrous; elytra shining reddish-yellow, a little infuscate about the scutellum. Antennae reddish-yellow, the last two segments infuscate. Legs reddish-yellow. Length 1.5 mm.

More brightly coloured than *halophilus* Kiesw. var. *simplicicollis* Woll. and of stouter build, the antennae similarly constructed. Head nearly as broad as the thorax, strongly coriaceous and impunctate, the eyes rather large. Thorax transverse (2.75:2), the sides gently rounded, before the scutellum with a pair of small, obsolete impressions separated by a short keel, the whole surface strongly coriaceous and with a few small scattered punctures. Elytra broader and longer than the thorax (3:2), slightly transverse, coarsely and moderately closely punctured, more coarsely than in *punctipennis* Kiesw. Abdomen finely coriaceous, almost impunctate, shining and with a rather long, scanty pubescence.

INDO-CHINA : Saigon. Type in my collection.

**Oxytelus (Emopotylus) armifrons** sp.n.

Shining; head red, yellowish-red in front; thorax yellowish-red; elytra yellow, more or less infuscate posteriorly; abdomen yellow, the bases of the tergites narrowly infuscate. Antennae red, the first four segments and legs reddish-yellow. Length 3-4 mm.

Very near *nitidifrons* Woll. (which must also be referred to the sub-genus *Emopotylus* Bernh.); differs in the brightly coloured head, different structure of the frontal margin and sculpture. ♂: head as broad as the thorax, transverse, the eye a good deal shorter than the broadly rounded post-ocular region; frontal region broad and depressed, impunctate, the frontal margin produced in the middle as a stout spine with rounded apex, the supra-orbital sulcus not extending much behind the eye, the vertex with a short median sulcus on each side of it, with close, slightly curved, scarcely punctured striae, at the base behind with moderate, closely placed punctures: antennae as in *nitidifrons*; thorax more retracted behind than in *nitidifrons* with a feeble emargination before the obtuse posterior angle, the sulci as in that species but the puncturation not quite so coarse, the sculpture of the elytra and abdomen similar in the two species. ♀: head smaller, but as broad as the thorax, the frontal margin slightly produced in the middle as a process with broadly rounded apex, the basal striae coarser and more punctured, the base without punctures; thorax narrower.

♂: 7th sternite produced as a short plate with rounded apex.

HONG KONG. Type in my collection.

**Oxytelus (Anotylus) nitiduloides** sp.n.

Shining black, the elytra yellow. Antennae black, the first two segments and legs reddish-yellow. Length 2 mm.

Extremely like *nitidulus* Gr. var. *luteipennis* Luze, but a little broader and also differing in the following respects: the elytra are not at all infusate, the first two segments of the antennae reddish-yellow, the head broader, the temples evenly rounded behind the eyes and fully as long, the punctures on the posterior half smaller; the sculpture of the thorax scarcely differs from that of *luteipennis*, but that of the elytra is distinctly coarser and deeper. In other respects similar.

HONG KONG. Type in my collection.

**Oxytelus (Anotylus) trivialis** sp.n.

Minute, fore-parts dull, head and thorax black, elytra yellowish-brown, abdomen shining. Antennae black, the 2nd segment pitchy. Legs yellow. Length 1 mm.

Very near *minutus* Cam., but narrower, the head more square, the clypeus although shining is closely punctured, thorax narrower, its sculpture and that of the head finer. Head a little narrower than the thorax, practically square, with the posterior angles rounded, the eyes small, much shorter than the temples; clypeus shining but punctured and separated by a fine line from the rest of the surface, on the middle of the disc with a small fovea, impunctate and strongly coriaceous. Antennae slender, formed as in *minutus*, the penultimate segments about twice as broad as long. Thorax transverse (2:1.5), completely dull, with a narrow median and broader lateral sulci, the sculpture as on the head: elytra longer than the thorax (2:1.5), very finely longitudinally striate with a few obsolete, scarcely perceptible punctures; abdomen feebly coriaceous, sparingly and finely punctured.

ANNAM: Saigon. Unique. My collection.

**Bledius (Elbidus) bituberculatus** sp.n.

Head and thorax moderately, elytra and abdomen more shining, dark reddish-brown. Antennae reddish, the first four segments and legs reddish-yellow. Length 4.5 mm.

Colour of *brunnipennis* F. and with sculpture of similar character, but slightly narrower and with different head. Head narrower than the thorax, the eyes large and prominent; deeply depressed between the antennal tubercles which are not strongly elevated and compressed but form a stout reddish-yellow ridge with a more shining black pyramidal tubercle at the base; clypeus truncate in front, its margins not elevated, shining and finely and closely granular, the rest of the surface also with a granular, but coarser sculpture. Antennae with the 3rd segment as long as the 2nd, 4th to 6th longer than broad, decreasing in length, 7th as long as broad, 8th to 10th transverse. Thorax transverse (3.75:3), convex, the sides almost straight and parallel for the anterior two-thirds, then suddenly retracted and coarctate with the base, along the middle with a narrow deep sulcus, the whole surface closely covered with rather large granules (larger than in *brunnipennis*) and without ground sculpture. Elytra slightly longer and broader than the thorax, slightly transverse and a little shorter than in *brunnipennis*, coarsely and closely punctured and with a fine

ground-sculpture. Abdomen feebly coriaceous, very sparingly covered with small scattered granules as in *brunnipennis*.

MALAY PENINSULA: West coast, Langkawi Island. Unique. My collection.

***Bledius (Hesperophilus) lucens* sp.n.**

Head black, dull, the rest shining, the thorax and abdomen pitchy-black, the elytra red, slightly infusate at the scutellum. Antennae red, the base and legs reddish-yellow. Length 4.5 mm.

Very like *cribricollis* Heer in colour, lustre and build, but with the head quite dull, the eyes more prominent, thorax longer with median sulcus, ground-sculpture absent except along the anterior border, the punctures about as coarse, but closer, elytra longer, but with sculpture scarcely differing from that of *cribricollis*, the antennae similar. Head nearly as broad as the thorax, the eyes prominent; between the antennal tubercles with a fine shining transverse line, scarcely perceptibly punctured, coriaceous, the vertex without sulcus or fovea. Thorax as long as broad, the sides gently rounded and gradually retracted behind, coarctate with the base, along the middle with a fine sulcus not reaching either the anterior or posterior margin, on each side about the middle with a little fossa, coarsely and closely punctured and without ground-sculpture except along the anterior border. Elytra a little longer (3.5:3) and a little broader than the thorax, as long as broad, closely and moderately coarsely punctured. Abdomen coriaceous, practically impunctate.

CHINA: Shanghai. Unique. My collection.

***Bledius (Hesperophilus) peraffinis* sp.n.**

Extremely like *birmanus* Cam., but differs in the following respects: the head and thorax are less shining, more greasy-lustrous, the head more strongly coriaceous, with short impressed line on the vertex and without the fine puncturation present in *birmanus*, the thorax with stronger ground sculpture and much more obsolete and less close puncturation, the elytra and abdomen as in *birmanus*. Length 2.5 mm.

It is possible that *birmanus* will prove to be identical with *helferi* Fauv.

PULO CONDORE (S. China Sea). Type in my collection.

***Bledius (Hesperophilus) perplexus* sp.n.**

Very similar to *peraffinis* Cam., but with narrower less shining, impunctate head and thorax and smaller eyes; in other respects scarcely differing. Length 2.5 mm.

FORMOSA: Suisharya (Sauter). Type in my collection.

This insect has been recorded with some doubt as *helferi* Fauv., but scarcely answers the description, which is more applicable to *birmanus* Cam.

Zoological Museum,

Tring, Herts.

June 19th, 1940.

*Quedius molochinus* Gravenhorst. (Col., Staphylinidae): a correction.—In 1938 Mr. A. A. Allen published a note in this magazine (*Ent. mon. Mag.*, 74:114) to point out that *Quedius picipennis* Paykull 'is the species of which our common *Q. molochinus* Grav. is a variety with red elytra.' He added, 'although it has long been recognised that we possess a rare form of *molochinus* with black elytra, its identity with the continental *Q. picipennis* Payk. seems to have escaped notice until very recently.' It is a pity that this has not escaped notice in this country entirely. Fowler was quite correct in calling the beetle in question *Quedius molochinus* Gravenhorst, and there is no need for us to resuscitate the continental error, which has already been corrected, of calling it *Quedius picipennis* Paykull, this name being a homonym and of no status whatever. This point has been fully dealt with by Méquignon, 1937 (*Misc. Ent.*, 38:1), who used the name *denudatus* Stephens for the form with black elytra. It would appear from Stephens' description that this name can be applied to the insect, for he stated that the insect was pitch-black, and he considered it possible that it might be an old form of *molochinus*. It must be noted that the specimens of *denudatus* in the Stephens cabinet have reddish elytra, but this does not invalidate the name, for they cannot be regarded as types in the face of the description, when also there is abundant evidence in the drawer that many species have been misplaced or specimens replaced at a later date, and that the collection does not represent the book. The presence of these red forms, therefore, is not sufficient justification for rejecting the name *denudatus*, and the description is enough to establish it.

I cannot agree with Allen in calling the black form 'rare.' In my experience it is much less abundant than typical *molochinus*, but nevertheless it is widely distributed and sometimes abundant. I possess examples from the following counties or vice-counties:—EX, WX, CB, OX, SR, MY, WY, WO, EI. Opinions as to rarity are in large measure affected by personal experience, which in its turn is determined by the localities visited and the methods adopted in collecting. Opposite opinions, therefore, must not be taken as contradictory, the one being correct and the other wrong, but must be considered within the limits of the experience of each collector and must be regarded as supplementary, each contributing one item towards our very small knowledge of the habits of our local fauna.—C. E. TOTTENHAM, c/o R. W. Lloyd, Esq., 1, 5 and 6 Albany, Piccadilly, W.1: July 15th, 1940.

*Dytiscus lapponicus* L. (Col.) in the Isles of Raasay and Soay (Inner Hebrides).—In a recent number of this magazine (1940, 76: 52) the first occurrence of this species in the Outer Hebrides was recorded, and it therefore seems advisable to note the localities in which we have detected it in the Inner Group. On the Isle of Raasay it was found to be widely distributed from Loch Uachdair and Loch na Bron in the north, both situated at about 250 ft. above sea level, to moorland pools (80-200 ft.) near Inverarish in the south. The first two stations are first rate trout lochs with more or less rocky bottoms. The Inverarish localities, on the other hand, are simply casual moorland pools, of little depth, which vanish in very dry seasons. Here the insect may be taken in company with its two congeners, *Dytiscus marginalis* L. and *D. punctulatus* F. In the west of the island *D. lapponicus* may be captured in two lochans, situated near the 250 ft. contour line just inland from Rudha an Inbhire. Of these, that nearest the coast appears as a dark, deep, narrow peaty sheet of water, whilst the other, Loch an Rathaid, is much more rocky and picturesque. South-west of these, towards Duncaan, *D. lapponicus* has been obtained from a small loch, situated at about 1,000 ft., drained by the Storab Burn. This loch is gradually



silting up and is edged by spongy masses of sphagnum, although the bottom is of a coarse sandy nature. Still nearer Duncaan, the next habitat (at 1,100 ft.) is nothing but a tiny pool; south of Duncaan there are additional stations in similar pools. Finally, it occurs somewhat rarely in the more extensive Loch na Mna, which, on account of its rocky margins and bottom, produces but little vegetation. On the Isle of Soay the species was netted very freely by Dr. G. Heslop Harrison and Miss H. B. Bond in a small lake lying at a height of 400 ft. on Beinn Bhreac. In this locality there was a very heavy preponderance of females.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne: April 25th, 1940.

*Cheimatobia brumata* L. (Lep., Geometridae) in the Isles of Eigg and Coll.—Larvae of this species were beaten in considerable numbers from various trees in the woodlands near Poll nam Partan on Eigg in June, 1938, and this fact caused but little surprise. However, in June, 1939, I was fortunate enough to encounter a small thicket of blackthorn (*Prunus spinosa* L.) on Coll. Still more luckily, I had my beating tray with me, and this was soon in use. Almost immediately larvae of *Cheimatobia brumata* were obtained in great numbers; the insect, as well as the shrub, is now recorded for the first time on the island.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne: April 25th, 1940.

*Some interesting cases of attacks by birds on butterflies.*—The following cases seem worthy of special notice:—

Mr. R. Moreau, of the East African Agricultural Research Station, Amani, Tanganyika Territory, wrote to me as follows on April 4th. 'When Mrs. Moreau was approaching Mombasa by sea on March 5th the migrating *Belenois* [the genus now called *Glycestha*] were so numerous that the Aden gulls (*Larus hemprichii* Bruch) were catching and eating them.'

Among the many butterflies given to the Hope Department of Entomology of the Oxford University Museum by the executors of the late Mr. J. Joicey, is a male specimen of the American *Papilio philenor philenor* L. bearing the label 'Caught at Sunningdale, Berks, August, 1914': doubtless bred from an imported pupa and released. The left fore-wing is missing; a large portion is missing from the right hind-wing anteriorly, and in area 1b of the right fore-wing a very distinct, large, beak-mark runs in from the margin half-way to the base of the area, slitting the wing along vein 1. The mark corresponds fairly well with the figure given by Collenette (1935, *Proc. Zool. Soc. Lond.*, 1935 (2): Pl. 1, fig. 29) for the imprint of the beak of a Red-backed Shrike.

A pair of *Acraea zetes jalema* Godt. in the Oxford Museum was taken in copula by myself in Uganda, on Kome Isle in Lake Victoria, on December 4th, 1918. Both are fresh specimens in good condition. The male had apparently been attacked by, and escaped from, a Bee Eater (*Merops* sp.), for a very clear mark, corresponding to the shape of the bill of one of those birds, is shown on the left hind-wing from the margin at vein 4 running inwards to the middle of the cell where it ends in a small area rubbed bare of scales. The species is typically aposematic in coloration and habits; it has the characteristic toughness of body and pliability of wing associated with such coloration and emits strongly-smelling yellow juice from the joints of the limbs, or from the antennae, if roughly handled. Thus, having been seized, and having escaped or been released as not wanted, it was able to fulfil its destiny unharmed.—G. D. HALE CARPENTER, Hope Department of Entomology, Oxford University Museum: July 15th, 1940.

## Obituary.

*Thomas Hudson Beare.*—On June 10th last Sir Thomas Hudson Beare, B.A., B.Sc., LL.D., M.Inst.C.E., F.R.S.E., F.R.E.S., died at his residence in Edinburgh at the age of 81. He was born at Adelaide, South Australia, on June 20th, 1859, being a younger son of the late Mr. Thomas Hudson Beare, of Netley, Adelaide. Educated at Prince Alfred College and the University of Adelaide, he was awarded the Fife (Australia) Scholarship in 1888, and came to University College, London. In 1885 he married a daughter of the late Mr. Alexander Newman, who survives him, and to whom we tender our deepest sympathy. In 1887, when only 29, he became Professor of Engineering in Heriot Watt College, Edinburgh, and two years later obtained the oldest engineering chair in Britain, that of Mechanical Engineering in University College, London. In 1901 he was appointed Regius Professor of Engineering in the University of Edinburgh, and in 1914 became Dean of the Faculty of Science. In 1926 he was accorded the honour of Knighthood, and ten years later received the honorary Degree of LL.D.

To mention but a few of Beare's numerous activities: he was many years ago a Captain in the Forth Volunteer Division of the Royal Engineers, and in 1914 did a great deal to encourage recruiting; for many years he was Chairman of the North Edinburgh Unionist Association; an original member of the Miners' Welfare Committee and a member of the Sanitary Protection Association. He was elected a Fellow of the Entomological Society of London in 1896, served as Vice-President in 1910, 1932 and 1934, and was three times elected on the Council of the Society; he was also a Vice-President of the Royal Society of Edinburgh.

I first met Hudson Beare nearly fifty years ago when he was living at Richmond, and we have spent many happy days together collecting beetles all over England and Scotland. Besides being an authority on the British Coleoptera, upon which he contributed many notes and papers to the entomological publications, he compiled the latest catalogue of British Beetles, 'A Catalogue of the Recorded Coleoptera of the British Isles,' London, 1930, as well as, in collaboration with the present writer, its predecessor, 'A Catalogue of British Coleoptera,' London, 1904. He amassed a fine collection of British beetles, in which, like the writer, he kept only his own captures, and to his industry we owe the addition of the following species to the British list:—*Thanasimus rufipes* Brahm, first captured in Britain by him in some numbers at Nethy Bridge (1912, *Ent. mon. Mag.*, 48:255); *Aulonium trisulcum* Geoff., first taken by C. J. C. Pool at Edmonton (1904, *Ent. Rec.*, 16:310); *Amischa scotica* Elliman (1909, *Ent. Rec.*, 21:33) and *Olophrum assimile* Payk. (1908, *Ent. Rec.*, 20:255) taken in company with the writer, the last-named species in some numbers, in flood refuse on the banks of the Spey, near Nethy Bridge, in 1908; *Aulonium ruficornis* Oliv. and *Hypophloeus fraxini* Kug., also in company with the writer, in Dean Forest in 1922 (1922, *Ent. mon. Mag.*, 58:193); *Anaspis hudsoni* Donis. was named after him by me on a beetle taken by me when staying with him at Nethy Bridge in 1908 (1909, *Ent. Rec.*, 21:60), further specimens were subsequently secured by himself.

It were difficult to find many people who have spent a more useful, energetic or fuller life. Farewell!—HORACE DONISTHORPE.

## Reviews.

'BRITISH WATER BEETLES.' By FRANK BALFOUR-BROWNE. 8vo, vol. 1, pp. xx+375, plates I—V. London (Ray Society). 1940. Price 25s.

This volume departs in various ways from the usual type of insect volume in this series, notably in the paucity of plates. Of the five that are given two are devoted to photomicrographs of the proventriculus of twelve species, two to photomicrographs of the elytral sculpture of 24 species (not all British), and one, reproduced from the author's paper in the 'Scottish Naturalist,' 1934, of larvae of the genus *Deronectes*. Of these the two portraying the elytral sculpture and the changing type of reticulation will, we feel sure, be generally appreciated. This paucity of plates is, however, to a great extent compensated by 89 text figures, mainly of structural details, in addition to 72 distributional maps. Part I, General (pp. 1—105), deals with the general structure of the adult, larval morphology, distribution, and methods of collecting and preserving. Part II, Systematic, comprises the Haliplidae, Hygrobiidae and the first part of the Dytiscidae, the Noterinae and the Laccophilini and Hydroporini of the Dytiscinae. Detailed descriptions of the different species are not given, nor the life histories; indeed it would seem that the work is intended to be taken as supplementary to existing works on the British Coleoptera rather than as a text-book complete in itself, the characters chiefly stressed being structural and underside characters only too frequently overlooked. The possession by the student of a good microscope is assumed. The treatment of the larvae is somewhat inadequate, the keys for their determination (in Pt. I) going no further than the genera, while under each species is given a bare reference to such description as may have appeared. The explanation of the Watson-Praeger system of vice-counties included in the chapter on distribution will be useful to others than students of the water beetles. It is a pity that so many minor typographical errors have been allowed to slip through, especially in the Bibliography and Index, but these do not detract seriously from the value of the work, and we look forward to the appearance of Vol. II.

'INSECT PESTS.' By W. C. HARVEY, M.D., D.P.H., M.R.San.I., and H. HILL, M.R.San.I., A.M.I.S.E., M.S.I.A. Crown 8vo, pp. x+292, 23 illustrations. London (H. K. Lewis & Co. Ltd.). 1940. Price 10s. 6d.

This is essentially a practical book giving much valuable information concerning control methods which we believe is not available elsewhere in such convenient form. It is intended chiefly for medical officers of health and sanitary inspectors and therefore deals very fully with the bed-bug, flea and louse, but more briefly with cockroaches, crickets, silver-fish, ants, itch-mites, psocids, earwigs, woodlice and house-flies. Agricultural pests are not included and in this respect the title of the book is misleadingly comprehensive. The opening chapters on the pests themselves (pp. 1—96) follow more or less familiar lines, and it is in the later ones (pp. 97—260), on the 'Principles and Practice of Disinfestation,' on which the authors are obviously experts, that its real merit lies. There is an appendix giving various examples of forms and records, the inevitable offspring of red-tape officialdom, and another of specimen propaganda leaflets. The work may well be recommended to the Commanding Officer who on receiving a complaint from his men replied: 'Bugs in the barracks? There always have been bugs in barracks and there always will be!'

RESULTS OF THE OXFORD UNIVERSITY EXPEDITION TO  
SARAWAK (BORNEO), 1932. GRYLLACRIDAE AND  
GRYLLIDAE (ORTHOPTERA).

BY DR. L. CHOPARD.

[Owing to the war it has been impossible to submit proofs of this paper to the author.—Eds.]

The collection of Gryllacrids and Gryllids includes fifty-eight species, of which seven only belong to the Gryllacridae. The Gryllidae are especially numerous in the subfamilies Trigonidiinae, Pentacentrinae and Itarinae, the last two being practically characteristic of the Malayan fauna. A certain number of species in the collection are recorded for the first time, and a certain difficulty arose from the fact that some of these have been recently described by me in an extensive paper on Malayan Gryllidae now in the press. It was impossible to consider these species as new, and the result is that they are recorded with incomplete bibliography, as the full description will appear later in *Treubia*; they are marked with an asterisk (\*) in the text.

The material includes that secured in 1932 by Dr. B. M. Hobby and the late Mr. A. W. Moore, who participated in the Expedition as entomologists, and also a small collection made by Father Hollis around Kuching in 1931-32. An account of the various collecting stations and references to published information concerning the Expedition appeared in 1938, *Ann. Mag. Nat. Hist.* (11) 2: 217-8. The types of new species are preserved in the British Museum (Nat. Hist.); selected specimens are in the Oxford University Museum and in my collection.

Fam. GRYLLACRIDAE.

Subfam. GRYLLACRINAE.

*Lyperogryllacris mjobergi* Karny.

*Gryllacris mjobergi* Karny, 1925, *Sarawak Mus. J.*, 8: 57, fig. 2.

Mt. Dulit, moss forest, 4,000-4,500 ft., 17.x., 1 ♂.

*Caustogryllacris nigrivertex* Karny.

*Gryllacris nigrivertex* Karny, 1925, *J. F.M.S. Mus.*, 13: 44, Pl. I, fig. 40.

Mt. Kalulong, old secondary forest, 9.x., 1 ♂.

These two species of Gryllacrids are known only from Borneo.

Subfam. RHAPHIDOPHORINAE.

*Rhaphidophora kinabaluensis* Karny.

*Rhaphidophora kinabaluensis* Karny, 1925, *J. F.M.S. Mus.*, 13: 4, fig. 2

Kuching (Father Hollis, 1931-32), 1 ♂.

*Rhaphidophora chopardi* Karny.*Rhaphidophora chopardi* Karny, 1924, *Treubia*, 5:36, fig. 22.

Foot of Mt. Dulit, cultivated land now waste, 17.viii., 1 ♂; Mt. Dulit, R. Lejok, primary forest, under flat rocks, in a burrow  $\frac{3}{4}$  in. diameter, 5.x., 1 ♀.

This *Rhaphidophora*, as well as the preceding one, is known from Borneo only; it is very probable that the burrow in which the female from the R. Lejok was found had not been dug by the insect itself.

*Rhaphidophora angustifrons* sp.n.

Types: Mt. Dulit, R. Koyan, primary forest, 2,500 ft., 19.x., 1 ♂; 21.x., 1 ♀.

Foot of Mt. Dulit, 10.ix., 1 ♂. Mt. Kalulong, primary forest, 1,800 ft., in rotting felled timber, 4.xi., 1 ♀.

♂. Large, finely pubescent species of a uniform rufous brown with legs a little lighter.

*Head* with frontal rostrum extremely narrow and compressed, forming a mere ridge with parallel sides, furrowed in its whole length but scarcely notched at apex; seen from the side, it is weakly sloping. Face rufous, shining. Anterior ocellus large, set on a triangular tubercle, which is separated from the apex of frontal rostrum by a small depression. *Pronotum* convex; lateral lobes one and a half times as long as high, with convex inferior margin, very much rounded anterior angle. *Abdomen* with plain 7th tergite; 10th tergite angularly notched; supero-anal valve long, strongly narrowing towards the apex, which is rounded, hollowed in its whole length. Styli short, a little compressed and swollen in the apical half. *Legs* long, rufous, pubescent. Anterior tibiae bearing beneath three external (posterior) spines and one internal (anterior); middle tibiae with two spines on each margin, above as well as beneath; apical spurs four, with a rather long spine between the inferior ones. Posterior femora armed with two to three rather strong denticles on the infero-internal margin; tibiae with twenty-two to twenty-four spines on each margin; supero-internal apical spur a little longer than metatarsus; this long, scarcely widening at apex, armed with six to seven denticles above.

♀. Subgenital plate small, triangular, ending in a long, sharp point. Ovipositor rather short, feebly curved, with little acute valves, the inferior ones presenting six rounded teeth near the apex.

Length of body: ♂ 30 mm., ♀ 32.5 mm.; ant. fem. 18 mm.; post. fem., ♂ 39 mm., ♀ 36.5 mm.; post. tib., ♂ 38 mm., ♀ 36 mm.; ovipositor, 19.5 mm.

By the armature of the posterior tibiae and by the shape of the subgenital plate of the female, this species reminds one of *R. dehaani* Karny, but the ovipositor is much longer; the very narrow frontal rostrum is rather peculiar in shape and seems characteristic for the species.

*Stonychophora glabra* sp.n.

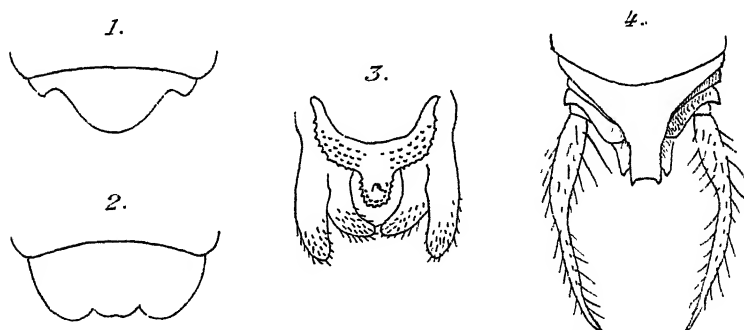
Type: Foot of Mt. Dulit, old secondary forest, 14.ix., 1 ♂.

Medium size; coloration dark brown, somewhat tinged with red-

dish, legs a little lighter; surface almost glabrous, shining.

*Head* with frontal rostrum rather narrow, furrowed almost to the base, feebly divided at apex in two strongly rounded tubercles. Face testaceous, shining. Anterior ocellus oval; posterior ocelli big, rounded. Antennae and palpi brown. *Pronotum* rather strongly compressed, with very convex posterior margin; lateral lobes high, with feebly and regularly convex inferior margin, much rounded angles. *Abdominal* tergites with feebly convex posterior margin from the 1st to the 6th, 7th a little carinated in the middle, presenting a long process with parallel margins, apex truncated with acute angles (fig. 4); supero-anal valve long, with the margins a little sinuated, converging backwards, but the apex still rather wide and rounded; subgenital plate wide, divided in the whole width by a weak carina; apex presenting between the styli a short longitudinal carina; styli rather long, compressed, tapering at apex, their bases rather close. Cerci rather short, thick, a little darkened at base. *Legs* rather short, lighter than the body. Anterior tibiae armed beneath with two spines on each margin, and two apical spurs only; metatarsi a little longer than the other two joints together, wholly carinated beneath. Apical spurs of the median femora subequal in length; tibiae armed above with two spines on each margin, beneath with two anterior spines and one posterior; tarsi similar to the anterior ones. Posterior femora rather short and thick, with unarmed inferior margins; tibiae armed with eighteen to nineteen spines on each margin above; supero-internal apical spur a little longer than the metatarsus; the latter rather short, compressed, enlarged at apex, carinated beneath, armed above with two spines, besides the apical spur. Length of body, 21 mm.; pronot., 8 mm.; post. fem., 20 mm.

The shape of the process of the 7th abdominal tergite brings this species close to *S. tessellata* Karny, 1930, but it is larger, with uniform coloration, and the large apical spur of posterior tibiae a little longer than the metatarsus.



FIGS. 1-4.—1, subgenital plate of the female of *Diestrammena sarawakana* sp.n.; 2, id. of *D. vandermeermohri* Willemse; 3, genitalia of male of *D. sarawakana*, from above; 4, last abdominal tergites of the male of *Stonychophora glabra* sp.n.

### ***Diestrammena sarawakana* sp.n.**

Types: Kuching (Father Hollis, 1931-32), 1 ♀, 1 ♂.

This species is extremely close to *D. vandermeermohri* Willemse, from Sumatra; it is exactly the same size and coloration.

It differs from the Sumatran species by the weaker armature of the posterior legs and chiefly by the shape of posterior abdominal segments. The posterior femora are completely unarmed or bear only a small spine on the infero-internal margin. In the female, the *subgenital plate* is subtriangular in shape, rounded at apex, with a very small basal lobe on each side: in *vandermeermohri*, this plate is trilobate, the median lobe being smaller than the other two and feebly notched in the middle (fig. 1-2). In the male, the 10th abdominal tergite is semi-circularly emarginated, forming two small triangular lobes; subgenital plate rounded. Genitalia presenting a rather large chitinated epiphallus in the shape of a short-branched Y, the inferior branch bearing at apex a short mucron (fig. 3). Length of body, 10 mm.; post. fem., 14 mm.; ovipositor, 7 mm.

This species differs from the only other Bornean species of *Dies-trammena* (*mjöbergi* Chop.) by its smaller size, its coloration being much more varied with brown, and the weaker armature of posterior tibiae. The shape of the epiphallus is about the same in both species, but there is no apical mucron in *mjöbergi* Chop.

A rather long series of specimens of both sexes of this species has been collected by Father Hollis; unfortunately, most of them lack the posterior legs. There is no indication that the species is cavernicolous, but it is very close to *vandermeermohri*, which is described by Willemse as living in caves.

#### Fam. GRYLLIDAE.

##### Subfam. GRYLLOTALPINAE.

##### *Gryllotalpa africana* Beauv.

*Gryllotalpa africana* Beauvois, 1805, *Ins. Afr. Amér.*: 220, Pl. 2 c, fig. 6.

Foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 6.ix., 1 ♀.

##### *Gryllotalpa fusca* Chop.

*Gryllotalpa fusca* Chopard, 1930, *Sarawak Mus. J.*, 4:4, Pl. 1, fig. 1-2.

*Gryllotalpa australis* Chopard (non Erichson), 1931, *Bull. Raffles Mus.*, 6: 125.

Mt. Dulit, R. Koyan, 2,500 ft., primary forest, 21.xi., 1 ♀;  
Mt. Kalulong, 1,800 ft., primary forest, in rotting felled timber, 4.xi., 1 ♀.

I regret that I am obliged to come back to the opinion previously expressed concerning the identity of this species with the Australian *G. australis*; although very close, the two species can be distinguished by several characters; the Malayan species is smaller, with antennae bearing a much longer pubescence and the elytral veins are more curved at base in the female.

##### Subfam. GRYLLINAE.

##### *Gryllulus mitratus* Burm.

*Gryllus mitratus* Burmeister, 1838, *Handb. Ent.*, 3: 734.

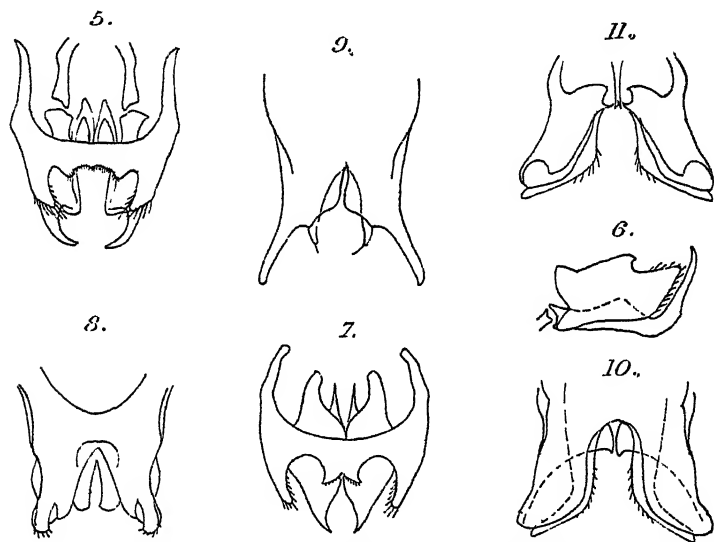
Foot of Mt. Dulit, at light in house, 4-27.viii., 1 ♂, 3 ♀.

*Scapsipedus mandibularis* Sauss.

*Scapsipedus mandibularis* Saussure, 1877, *Mém. Soc. Phys. Genève*, 25: 246.

Foot of Mt. Dulit, cultivated lands now waste, 18.viii., 2 ♂; in house, 25.ix., 1 ♀.

This species has been described from Bombay; the male differs in the shape of the genitalia from *S. aspersus* Walk. (= *berthellus* Sauss.); in the latter, the superior band presents a prominence notched at apex in the middle, and the inferior parts are triangular, whereas in *mandibularis* the band is feebly angulate in the middle and the inferior parts are tooth-like (figs. 5-7). Besides, the male of *mandibularis* has a wider head than *aspersus* and the apical field of elytra is a little larger and divided in more regular areolae.



FIGS. 5-11.—5, genitalia of male of *Scapsipedus mandibularis* Sauss., from above; 6, id., lateral view; 7, genitalia of *S. aspersus* Walk. (from Tsushima); 8, genitalia of *Metiochodes flavescens* Chop., from above; 9, id. of *M. fulvus* sp.n.; 10, id. of *M. platycephalus* Chop.; 11, id., lateral view.

\**Duolandrevus keyicus* Chop., 1940.

Foot of Mt. Dulit, in rotting felled timber, 23.viii., 1 ♀.

This species, which is characterised by a very small head, was previously known from Key Islands only.

*Duolandrevus pubescens* Chop.

*Duolandrevus pubescens* Chopard, 1940, *Sarawak Mus. J.*, 4:9, fig. 8.

Mt. Kalulong, 1,800 ft., primary forest, in rotting felled timber, 4.xi., 1 ♀.



It seems quite satisfactory to record this species as *D. pubescens*, of which the male alone was previously known.

The shape of the head of the female, the pronotum and legs are much as in the male. *Abdomen* rufous brown, covered with an abundant silky pubescence; subgenital plate small with feebly notched apical margin. Ovipositor rather short and thin, its apical valves narrow, acute, the superior ones with straight superior margin, forming an acute angle at base, their external face presenting in the middle a strong carina; inferior valves also strongly carinated along the inferior margin. *Elytra* very short, extending only to the apex of metanotum, contiguous on the median line, with apical margin feebly concave, internal margin straight, very short; surface rufous brown, feebly pubescent; dorsal field presenting six more or less anastomosed veins, the spaces between the veins punctured, chiefly at base; lateral field with six feebly curved, regularly distant veins.

Length of body, 19.5 mm.; pronot., 3.4 mm.; post. fem., 14.5 mm.; elytra, 2.5 mm.; ovipositor, 11 mm.

#### Subfam. TRIGONIDIINAE.

\**Anaxipha angustifemur* Chop., 1940.

Foot of Mt. Dulit, old secondary forest, 16.ix., 1 ♀.

\**Anaxipha trivittata* Chop., 1940.

Foot of Mt. Dulit, old secondary forest, undergrowth, 14.viii., 1 ♂; cultivated land now waste, 18.viii., 1 ♀.

These two species of *Anaxipha* are known from Borneo only.

#### *Anaxipha maculipes* Chop.

*Anaxipha maculipes* Chopard, 1929, *Bull. Raffles Mus.*, 2: 109.

R. Koyan, 2,500 ft., primary forest, beaten from trees on river bank, 15.xi., 1 ♀.

#### *Homoeoxipha lycoides* Walk.

*Phyllopalpus lycoides* Walker, 1869, *Cat. Derm. Salt. B.M.*, 1: 71.

Foot of Mt. Dulit, light trap, 3.x., 1 ♀.

#### *Paratrigonidium fuscocinctum* Chop.

*Paratrigonidium fuscocinctum* Chopard, 1925, *Treubia*, 6: 151, fig. 11.

Mt. Kalulong, old secondary forest, 5.xi., 1 ♀.

#### \**Paranaxipha xanthoneura* Chop., 1940.

Dulit trail, primary forest, 16.viii., 1 ♀.

This species differs from *P. ornatipes* Chop., type of the genus, by its smaller size and by the more simple elytral venation, which does not present any trace of a mirror in the male. It is described from Borneo, but exists also in the Malay peninsula.

#### *Amusurgus karnyi* Chop.

*Metioche karnyi* Chopard, 1930, *Sarawak Mus. J.*, 4: 26, fig. 42-43.

Mt. Dulit, 3,800 ft., primary forest, damp leaves, 28.v., 1 ♂ ; Dulit trail, 16.viii., 1 ♀ ; foot of Mt. Dulit, 19.ix., 1 ♂ ; R. Koyan, 2,500 ft., primary forest, 20.xi., 1 ♂ ; 8.x., light trap, 1 ♂ .

The elytra being strongly pubescent, this species must be included in *Amusurgus* instead of *Metioche*.

*\*Amusurgus fuscus* Chop., 1940.

Dulit trail, primary forest, 16.viii., 1 ♀ .

This very small species, of a dark chestnut brown with yellowish legs, is described from Borneo.

*Metiochodes flavescens* Chop.

*Metiochodes flavescens* Chopard, 1931, *Ark. Zool.*, 23A: 13, fig. 1.

Foot of Mt. Dulit, light traps, 25.ix.-9.x., 2 ♂ , 2 ♀ ; R. Kapah, trib. of R. Tinjar, 1.x., 1 ♂ .

This species was known from Sumatra (type), N. Palawan and Perak.

*\*Metiochodes pindleburyi* Chop., 1940.

Foot of Mt. Dulit, light traps, 28.viii., 1 ♀ .

*\*Metiochodes platycephalus* Chop., 1940.

Foot of Mt. Dulit, light traps, 1.ix., 1 ♀ , 5.ix., 1 ♂ .

*Metiochodes ornatus* Chop., 1940.

Foot of Mt. Dulit, old secondary forest, 29.viii., 1 ♂ ; light trap, 4.ix., 1 ♂ .

These three species of *Metiochodes* are described from Borneo.

***Metiochodes fulvus* sp.n.**

Type: Foot of Mt. Dulit, 30.ix., 1 ♂ .

Very close to *flavescens*, but the coloration is testaceous instead of yellow.

*Head* with flat forehead, eyes horizontally lengthened; palpi as in *flavescens*. *Elytra* and *legs* presenting no difference from *flavescens*, except in coloration. The genitalia are quite different in each species; in *flavescens* they are bilobed; in *fulvus* they present only a long process externally (figs. 8-9); in *platycephalus*, which is also close to the two species, the genitalia are wide, not divided (figs. 10-11).

Length of body, 6.3 mm.; length with wings, 9.5 mm.

This species is so close to *flavescens* that it could be taken for a testaceous variety of this species if there were not such a great difference in the shape of the copulatory organ of the male.

*Metioche flavipes* Sauss.

*Trigonidium flavipes* Saussure, 1878, *Mém. Soc. Phys. Genève*, 25: 465, Pl. 16 (XLVII), figs. 1, 2 i, 2 e.

Foot of Mt. Dulit, cultivated land now waste, 22.viii., 1 ♀.

This species is probably the micropterous condition of *M. vittaticollis* Stål.

Subfam. MOGOPLISTINAE.

*Ornebius angustifrons* Chop.

*Liphoplus angustifrons* Chopard, 1930, *Sarawak Mus. J.*, 4: 17.

R. Koyan, 2,500 ft., primary forest, beaten from trees on river bank, 15.xi., 1 ♂.

This species was known from Mt. Matang (Sarawak) and Mt. Tibang (W. Borneo).

Subfam. SCLEROPTERINAE.

*Scleropterus coriaceus* Haan.

*Gryllus (Scleropterus) coriaceus* Haan, 1842, *Temn. Verh. Orth.*: 232, Pl. 20, fig. 7.

R. Koyan, 2,500 ft., primary forest, rotten wood, 18.xi., 1 nymph ♂.

Subfam. PENTACENTRINAE.

*Lissotrachelus ater* Br.

*Lissotrachelus ater* Brunner, 1893, *Ann. Mus. Genova*, 33: 206.

Foot of Mt. Dulit, secondary forest, light trap, 13.ix., 1 ♂, 14.ix., 1 ♀; on bark of felled tree, 5.ix., 1 ♂, 1 ♀; old secondary forest, recent clearing, 2.viii., 1 ♀; Mt. Kalulong, old secondary forest, 5.xi., 1 ♂.

*Pentacentrus unifenestratus* Caud.

*Pentacentrus unifenestratus* Caudell, 1927, *Proc. U.S. Nat. Mus.*, 71: 39.

Foot of Mt. Dulit, 17.ix., 1 ♂.

\**Pentacentrus cornutus* Chop., 1940.

Foot of Mt. Dulit, 26.viii., 1 ♂; 2.ix., 1 ♂.

This species is characterised by the large size of the genitalia and by their shape, which is that of curved horns.

\**Pentacentrus quadrilineatus* Chop., 1940.

Foot of Mt. Dulit, 25.ix., 1 ♂, 1 ♀; 2.x., 1 ♂.

The head of this species has particularly well marked longitudinal light bands. In the female, the subgenital plate is notched in the shape of a half circle (fig. 12).

*Pentacentrus acuminatus* Chop.

*Pentacentrus acuminatus* Chopard, 1930, *Sarawak Mus. J.*, 4: 19, figs. 25-27.

Foot of Mt. Dulit, 31.x., 1 ♀.

This species is very different from the three preceding ones in the shape of the subgenital plate, both male and female.

**Pentacentrus laminifer** sp.n.

Types: Mt. Dulit, 4,000 ft., moss forest, 21.x., 1 ♂, 1 ♀.

Besides the types, seven males and four females are represented in the collection, all from the same place.

♂. Very similar to *P. mjobergi* Chop., which has been described also from Mt. Dulit.

*Head* of a nearly uniform yellowish-brown, presenting only traces of darker longitudinal bands. Ocelli subequal in size. Antennae brown. *Pronotum* wholly brownish, with lighter margins, very pubescent. Third *abdominal* tergite with posterior margin somewhat elevated, bearing a process directed forwards, triangular, with two spines near the apex (fig. 13); on each side of this process there is a rather large tubercle; 10th tergite bearing a large, almost vertical process, which is enlarged at apex and ending in two small teeth (figs. 14-15); supero-anal valve triangular, rounded at apex, covered at base with small spines. Genitalia presenting on each side two long curved points (fig. 16). *Legs* brownish, very pubescent. Anterior tibiae perforated on internal face only with a large oval tympanum. Middle tibiae vaguely annulated with brown. Posterior femora presenting on external face three transverse brown bands which are rather feebly visible. *Elytra* rather light, presenting two triangular spots near the base and the transverse veinlets which are marked with brown; lateral field brown at base, the remaining part almost transparent, with brown veins. Wings light brown.

♀. The females which have been captured at the same place and at the same time as the males of this species are so similar to *mjobergi* that it is practically impossible to separate the species; the shape of the subgenital plate is exactly the same (fig. 17); the colour is not so dark in *laminifer* and the antennae are usually non-annulated, but these characters are not absolutely constant and are of minor value.

Length of body, 8 mm.; length with wings, 12 mm.

The male of this species is very well characterised by the shape of the abdominal tergites, but, as stated above, the female is very difficult to distinguish from that of *mjobergi*.

**Pentacentrus quadridentatus** sp.n.

Type: Foot of Mt. Dulit, 29.viii., 1 ♂; 21.vii., 1 ♂.

These two insects are in a very bad state of preservation, but the genitalia are so characteristic that their shape enables the species to be recognised. It is very similar to *mjobergi*.

*Head* nearly without any ornament; ocelli small, subequal in size. *Supero-anal valve* very wide and short, with feebly concave apical margin, presenting at base two groups of spinules; two such groups, smaller, are inserted on the posterior margin of the 9th tergite. Genitalia differing considerably from those of *mjobergi*, being armed with four strong spines on each side (fig. 18).

Length of body, 8 mm.; length with wings, 12 mm.

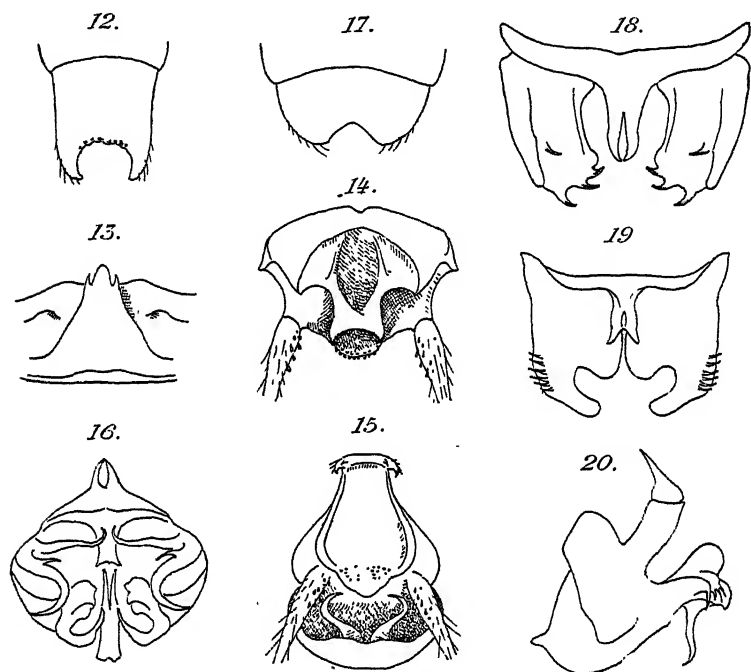
**Pentacentrus sexspinosus** sp.n.

Type: Mt. Dulit, 4,000 ft., moss forest, 12.x., 1 ♂; 21.x., 1 ♂ cotype (coll. Chopard).

Very similar to the preceding.

*Antennae* brown; anterior ocellus smaller than the lateral ones. Dorsal field of *elytra* presenting a rather large brown spot near the base, the transverse veinlets narrowly lined with brown; lateral field dark brown. *Supero-anal valve* wide, with feebly concave posterior margin, basal half covered with spinules throughout except on the median line; posterior margin of the 10th tergite provided with four rows of spinules on its whole length. Genitalia of the same type as *quadridentatus*, but armed with a row of six spines on each lobe (figs. 19-20).

Length of body, 8.5 mm.; length with wings, 13 mm.



FIGS. 12-20.—12, subgenital plate of female of *Pentacentrus quadrilineatus* Chop.; 13, process of 3rd abdominal tergite of the male of *P. laminifer* sp.n.; 14, apex of abdomen of the same, from above; 15, id., frontal view; 16, genitalia of *P. laminifer*, frontal view; 17, subgenital plate of female of *P. laminifer*; 18, genitalia of *P. quadridentatus* sp.n., from above; 19, genitalia of *P. sexspinosus* sp.n., from above; 20, id., lateral view.

*Pentacentrus mjobergi* Chop.

*Pentacentrus mjobergi* Chopard, 1930, *Sarawak Mus. J.*, 4: 18, figs. 19-20.

Foot of Mt. Dulit, light traps, 4.x., 1 ♀; 10.x., 1 ♀.

Subfam. PHALANGOPSINAE.

*Parendacustes javanus* Chop.

*Parendacustes javanus* Chopard, 1925, *Ann. Soc. ent. Fr.*, 94: 306, figs. 30-31.

Mt. Dulit, 4,000 ft., moss forest, 19.x., 1 ♂.

This species was known from Java only.

Subfam. ENEOPTERINAE.

*Nisitira vittata* Haan.

*Gryllus* (*Platydictylus*) *vittatus* Haan, 1842, *Temn. Verh. Orth.*: 234.

Foot of Mt. Dulit, cultivated land now waste, 13.viii., 2 ♂; old secondary forest, recent clearing, 29.viii., 8 ♀; Mt. Dulit, 4,000 ft., moss forest, 27.x., 2 ♀; flying around house, 1 ♀; R. Kapah, trib. of R. Tinjar, light trap, 4.x., 1 ♀; Claudetown, rubber garden, medium shady path, 27.vii., 1 ♀. Several larvae at different stages from these localities, and also from Mt. Kalulong.

This species is widely spread in the Malay Islands; it presents, as well as the other species of the genus, a voluminous Hancock's gland on the metanotum (fig. 22); this gland is composed of two deep depressions separated by a longitudinal ridge ending in a small tubercle; this tubercle and the sides of the glands are furnished with an abundant pubescence; the posterior part of the metanotum is elevated in a strong tubercle and bears two other small depressions which are perhaps glandular also.

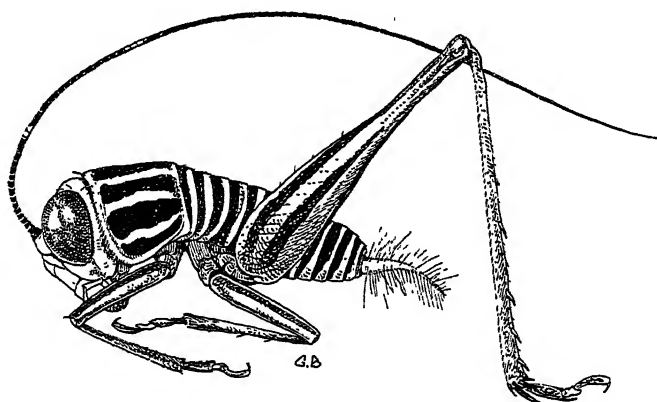


FIG. 21.—Very young larva of *Nisitira vittata* Haan.

The larvae of *Nisitira vittata* are very pretty little creatures, exhibiting a very peculiar colour pattern (fig. 21); the pronotum is longitudinally banded with brown, whereas similar bands are disposed transversally on the abdomen; the posterior femora present two longitudinal brown bands. This pattern is very obvious in quite small larvae, but it disappears gradually with the growth of the insect.

*Nisitra insignis* Sauss.*Nisitra insignis* Saussure, 1878, *Mém. Soc. Phys. Genève*, 25: 515.

Foot of Mt. Dulit, 18-28.viii., 2 ♂, 3 ♀; Mt. Dulit, 4,000 ft., primary forest, 26.x., 1 ♂, 2 ♀; R. Koyan, primary forest, 16.xi., 2 ♀.

This species is usually larger than the preceding, with longer legs; it also differs in that the frontal rostrum is a little wider at the base; in the middle the dividing vein of the mirror ends on the middle of the adjacent cell instead of at the inferior angle, as in *vittata*; finally, the wings are completely smoky.

*Cardiodactylus gaimardi* Serv.*Platydictylus gaimardi* Serville, 1838, *Ins. Orth.*: 366.

Foot of Mt. Dulit, junction of rivers Tinjar and Lejok, 5.ix., 1 ♂; fish trap, 10.ix., 1 ♀; 24.ix., 1 ♂; R. Koyan, 2,500 ft., primary forest, 19.x., 1 ♀.

These *Cardiodactylus* are smaller and more vividly coloured than the type of *gaimardi* from Australia; they may represent a local race.

## Subfam. ITARINAE.

*Itara latipennis* Chop.*Itara latipennis* Chopard, 1930, *Sarawak Mus. J.*, 4: 29, figs. 47-51.

Mt. Dulit, 4,000 ft., moss forest, 18.x., 1 ♂, 24.x., 1 ♀; R. Koyan, primary forest, 2,500 ft., 17.xi., 1 ♂.

*Itara mjöbergi* Chop.*Itara mjöbergi* Chopard, 1930, *Sarawak Mus. J.*, 4: 30, figs. 54-55, 57.

Mt. Dulit, R. Koyan, 2,500 ft., primary forest, 17.xi., 1 ♀.

\**Itara denticulata* Chop., 1940.

Foot of Mt. Dulit, old secondary forest, light trap, 4.ix., 1 ♀.

Described from Mt. Kinabalu; very similar to the preceding, but with narrower frontal rostrum; in the male, the genitalia are strongly denticulated beneath; in the female the subgenital plate is long, somewhat narrowing at apex and rather strongly notched.

\**Itara minuta* Chop., 1940.

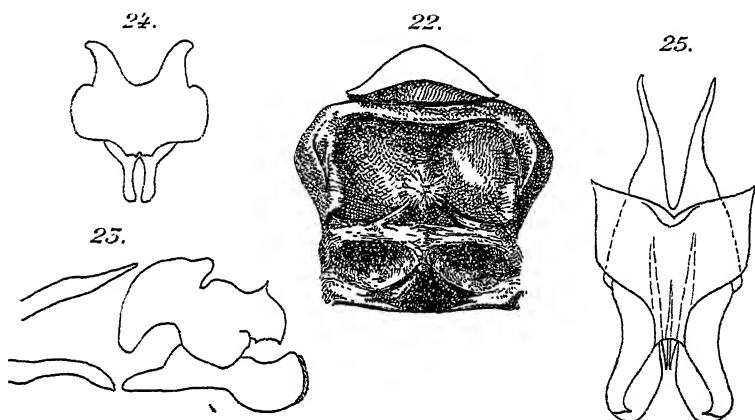
Foot of Mt. Dulit, primary forest, running on dead leaves, 18.ix., 1 ♀; light traps, 19.viii., 1 ♀; R. Kapah, trib. of R. Tinjar, very shady primitive forest, in humus layer, 23.ix., 1 ♂.

The female only of this species was described from Bettotan, Borneo.

The male is a little larger than the female, presenting the same general characters, which, except the small size, are those of the other species of the genus. *Elytra* brown, very thinly pubescent, the mirror being relatively very

much lengthened transversally (the width being more than one and a half times the length), divided about the middle by a strongly undulated vein; five very irregular oblique veins, inserted on a transverse nervure which is fairly distant from the anal vein; the two first oblique veins come from the same point and are strongly diverging, the other three are very short, inserted in the angle of the anal vein; apical field long, presenting six regularly distant sectors; the reticulation between them composed of narrow, long, very regular cells. *Genitalia* with superior part short and wide, the inferior pieces much longer, rounded (figs. 23-24).

Length of body, 12.5 mm.; length with wings, 18.5 mm.; elytra, 12 mm.



FIGS. 22-25.—22, Hancock's gland of the male of *Nisitra vittata* Haan; 23, genitalia of the male of *Itara minuta* Chop., lateral view; 24, apex of the same, from above; 25, genitalia of *Heterotrypus moorei*, from above.

### *Heterotrypus moorei* sp.n.

Type: Foot of Mt. Dulit, light trap, 11.ix., 1 ♂.

A species of medium size and rather light coloration.

*Head* brown with two narrow yellowish bands on the occiput, which proceed along the eye, without interruption, to the apex of frontal rostrum. Face with superior part chestnut brown, inferior part yellow, the parting line very conspicuous, horizontal. Antennae brownish; palpi yellow. *Pronotum* slightly narrowing in front, with sinuated posterior margin; disc chestnut brown with usual impressions lighter, very pubescent; lateral lobes with inferior margin strongly convex, rounded angles; coloration chestnut brown with a yellow band along the inferior margin, the separation between the two colours very distinct, horizontal. *Abdomen* yellowish brown, pubescent. Genitalia forming two folded lobes, rounded at apex with a small tooth above (fig. 25). *Legs* a little lighter than the body, the tibiae rather neatly annulated with brown. Anterior tibiae strongly dilated at base, presenting a rather large oval tympanum in the bottom of a furrow on internal face, the external tympanum a little smaller, oval. Posterior tibiae brown with two wide whitish rings, their superior margins very finely serrulated, bearing four rather short brown spines; metatarsi brown with a white ring in the middle, armed with five denticles on the supero-external



margin. *Elytra* very light testaceous, nearly transparent, finely pubescent; mirror a little wider than long, angulated in front, divided into three unequal parts by two nearly straight veins; the median part is the widest, the anterior one is triangular, the inferior very small; diagonal vein short, furcate at base; apical field of medium size, presenting four regularly distant sectors; nine oblique veins, of which five emerge almost from the same point near the anal knot, the 6th from the middle of the anal vein, the other three in the angle. Wings feebly over-reaching the elytra.

Length of body, 12.5 mm.; length with wings, 19 mm.; post. fem., 11 mm.; elytra, 12.5 mm.

This species is close to *jacobsoni* Chop., but is smaller, with a much more conspicuous coloration, chiefly on the face and the lateral lobes of pronotum; the maxillary palpi are not so long; the posterior part of the mirror is narrower, the second dividing vein almost straight.

### *Heterotrypus hobbyi* sp.n.

Types: Mt. Kalulong, 1,800 ft., primary forest, in rotting felled timber, 4.xi., 1 ♂; Mt. Dulit, Dulit trail, 2,000 ft., primary forest, 16.viii., 1 ♀.

Another female comes from the foot of Mt. Dulit, secondary forest, 5.viii.

*Head* presenting only very indefinite traces of brown bands on the occiput; frontal rostrum almost as wide as the 1st antennal joint, with parallel margins. Ocelli small, the anterior one almost at the apex of the rostrum. Face yellowish testaceous. Antennae and palpi yellowish brown; 4th joint of the maxillary palpi shorter than 3rd, 5th long, rather strongly dilated and truncated at apex. *Pronotum* rather strongly narrowing in front, with anterior and posterior margins straight, ciliated; disc light chestnut brown, nearly flat, covered with a silky pubescence; lateral lobes yellowish, with inferior margin strongly ascending backwards. *Abdomen* yellowish-brown, pubescent; subgenital plate small, slightly narrowing backwards, with posterior margin feebly notched. *Legs* of the same colour as the body, indistinctly annulated with brown. Anterior tibiae perforated with a rather large tympanum on either side. Posterior femora relatively short and strong; tibiae armed on each margin with four long, slender spines, a little hooked at apex; on the external margin, there are 9+4+4+2 denticles at base and between the spines; on the internal margin 5+1+1+0; metatarsi very pubescent, armed with six denticles on the external margin. *Elytra* wide and short, finely pubescent, with apical field much reduced; mirror a little wider than long, rounded backwards, with very open anterior angle; it is divided into three unequal parts, the median being the narrowest, chiefly in its external half; superior dividing vein straight, a little curved near the apex only; inferior dividing vein very strongly sinuated; diagonal vein short, curved, furcate at base; eight oblique veins, rather regularly disposed along the anal vein and almost parallel; apical field very short, rounded, provided with two sectors. Wings no longer than the elytra.

Length of body, 11 mm.; length with wings, 13.5 mm.; post. fem., 10 mm.; elytra, 9.5 mm.

♀ (allotype). *Head*, *thorax* and *legs* very much like the male. *Subgenital* plate presenting a rather deep, narrow, rounded notch, the lobes being very much

rounded. Ovipositor rather long, slender, straight; apical valves long, narrow, subacute, the superior ones presenting two ridges in the shape of a >, forming near the inferior margins two large basal teeth; the inferior valves are provided with four inferior, subacute teeth, and a rounded notch after the second tooth. *Elytra* exceeding very little the abdominal extremity, pubescent, brownish with a light translucent spot on the edge near the anterior third; *Ax1*, *Ax2* and *An* a little sinuated, almost parallel, except towards the apex, where they converge, ending almost on the same point, about the apical third of the internal margin; *Cu* trifurcate; *M* furcate near the apex; transverse veinlets rather scarce and irregular; intercalated triangle rather large; lateral field almost transparent, *Sc* bearing fourteen branches. Wings as long as the elytra.

Length of body, 10 mm.; length with wings, 12.5 mm.; post. fem., 10.5 mm.; ovipositor, 6 mm.

This species presents the same general shape, short and wide, as *H. kurnyi* Chop., but it is smaller and darker; in the male the mirror is divided into three very unequal parts; in the female, the ovipositor is much shorter.

#### Subfam. PODOSCIRTINAE.

##### *Calyptotrypus parvispinosus* Chop.

*Calyptotrypus parvispinosus* Chopard, 1930, *Sarawak Mus. J.*, 4: 66-68.

Foot of Mt. Dulit, traps, 6.ix., 2 ♀; Mt. Dulit, moss forest, beating, 27.x., 1 ♂.

##### *Calyptotrypus furcifer* Chop.

*Calyptotrypus furcifer* Chopard, 1930, *Sarawak Mus. J.*, 4: 35, figs. 61, 69.

Foot of Mt. Dulit, light traps, 1-26.ix., 5 ♂, 1 ♀.

##### \**Calyptotrypus bipunctatus* Chop., 1940.

Foot of Mt. Dulit, light trap, 19.ix., 1 ♂.

Besides the shape of genitalia, which is very important for separating the different species of *Calyptotrypus*, this form can be distinguished by two rather large brown spots on the posterior femora. It is described from the Malay Peninsula, whereas the other two species here recorded are known from Sarawak only.

##### *Madasumma willemsei* Chop.

*Madasumma willemsei* Chopard, 1925, *Ann. Soc. ent Fr.*, 94: 324, figs. 59-60.

Foot of Mt. Dulit, 4.viii., 1 ♂.

This large species was described from Sumatra.

##### *Mnesibulus bicolor* Haan.

*Gryllus (Phalangopsis) bicolor* Haan, 1842, *Temn. Verh.*, Orth.: 235.

Foot of Mt. Dulit, secondary forest, light trap, 25.viii., 1 ♀.

#### Gen. **Aphonoides**, nov. gen.

While studying extensive series of the species included in the

genus *Aphonomorphus* Rehn, it was found necessary to divide this genus into several, of which *Aphonoides* is one; it includes the species which have the internal tympanum of anterior tibiae open, the external one obliterated, and in which the vein Sc of elytra bears a few oblique branches. It differs from *Aphonomorphus* s.str. by the shape of maxillary palpi, the 5th joint of which is narrow, long and obliquely truncated at apex. Genotype: *aphonoides punctatus* Haan [selected by the editors as it is impossible to communicate with the author].

*Aphonoides punctatus* Haan.

*Gryllus (Eneoptera) punctatus* Haan, 1842, *Temn. Verh.*, Orth.: 232, Pl. 20, fig. 6.

Mt. Dulit, 4,000 ft., moss forest, at light, 21.x., 1 ♀.

\**Aphonoides karnyi* Chop., 1940.

Mt. Dulit, 4,000 ft., moss forest, light traps, 19-28.x., 17 ♂, 2 ♀; foot of Mt. Dulit, 18.ix., 1 ♀.

A rather small, brownish testaceous species, described from Java.

\**Aphonoides pubescens* Chop., 1940.

Foot of Mt. Dulit, 18.ix., 2 ♀.

This species is known from Borneo and Java; it is rather small, greyish, pubescent, with lighter legs.

*Aphonoides angustifrons* Chop.

*Podoscirtus angustifrons* Chopard, 1930, *Sarawak Mus. J.*, 4: 39, fig. 72.

Foot of Mt. Dulit, light trap, 23.viii., 1 ♂, 5.ix., 1 ♀; Mt. Dulit, 4,000 ft., moss forest, 21.x., 1 ♂.

*Euscyrtus concinnus* Haan.

*Gryllus (Eneoptera) concinnus* Haan, 1842, *Temn. Verh.*, Orth.: 231, Pl. 20, fig. 3.

Foot of Mt. Dulit, cultivated land now waste, 18.viii., 1 ♂.

Muséum Nationale d'Histoire Naturelle,

45 bis Rue de Buffon, Paris, Ve.

April 27th, 1940.

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*Barypithes curvimanus* Duv. (Col., Curculionidae) in N.E. Co. Dublin.—On June 18th, 1940, I took four specimens of *Barypithes curvimanus* Duv. crawling on a restricted area on the top of the dam at the 'reservoir' in 'St. Annes,' Clontarf, Co. Dublin, and since that date I have obtained four more examples. The species is very local at this place, all eight specimens being taken in an area of two feet by about eighteen inches, none being seen elsewhere along the dam, which is about 90 yards long; in the centre there is an overflow channel and *B. curvimanus* is on the one side, *B. araneiformis* Schr. being on the other. This is the third Irish station for this interesting species, which was added to the British list by Mr. J. N. Halbert in 1937 (cf. 1937, *Ent. mon. Mag.*, 73:54).—EUGENE O'MAHONY, National Museum of Ireland, Kildare Street, Dublin: June 25th, 1940.

## NOTES ON IRISH SIPHONAPTERA.—II.

BY EUGENE O'MAHONY.

Since the publication of Part I of these 'Notes' (1939, *Ent. mon. Mag.*, 75:253-4), the following specimens have been obtained, and I have to thank Miss E. McInnally, Messrs: F. W. Fox, F. G. Meagher, P. E. Ryan and A. E. Williams for material from various hosts.

## STRAYS.

A number of strays have been taken, including some of particular interest, as they do not appear to have been taken on these hosts before.

*Pulex irritans* L.—On Kerry Blue Terrier, Sutton, Co. Dublin, E.McI., Nov. 1939, 1 ♂, in company with eight examples of the true dog flea, *Ctenocephalides canis* Curt.

*Spilopsyllus cuniculi* Dale.—A ♂, from fallow deer, *Dama dama* (L.), Co. Galway, F.G.M.; 3 ♂♂, from fox, *Vulpes v. crucigera* Bech., Kilkenny, O'M., Jan. 1940. Normally found on rabbits and hares.

*Ceratophyllus gallinae* Schr.—One ♀, from marten, *Martes m. martes* L., Co. Waterford, A.E.W., Jan. 1939; a ♂, on *Homo*, Tallaght, Co. Dublin, F.W.F., April, 1940. This species is normally found on birds.

*Nosopsyllus fasciatus* Bosc.—Two ♂♂ and one ♀, from hedgehog, *Erinaceus e. europaeus* L., Tallaght, Co. Dublin, F.W.F., April, 1940. This was an unusual capture, as this flea is the normal parasite of rats and mice. I asked Mr. Fox to try and obtain another hedgehog from the same locality and he caught one nearby shortly after. This produced one ♀, *Ctenophthalmus agyrtes nobilis* Roths. (another parasite of rats and mice), and one ♂ of the true hedgehog flea, *Archaeopsylla e. erinacci* Bouché. The method of collecting the fleas was to wrap the hedgehog in a cloth, afterwards taking the specimens from the wrapper, the hedgehog being liberated.

*Paraceras melis* (Walker).—Two ♀♀ on fox, Co. Galway, O'M., November, 1939. This is the true flea of the badger, *Meles m. meles* (L.).

## OTHER RECORDS.

*Ceratophyllus columbae* W. & G.—A number of both sexes bred from the nests of pigeons which breed on the windows of the museum, April, 1940.

*Leptopsylla segnis* Schön.—Seven ♂♂ and six ♀♀ from a specimen of the house mouse, *Mus musculus orientalis* Cretz. (this subspecies of mouse was added to the Irish fauna in 1935, cf. O'Mahony, 1935, *Irish Nat. J.*, 5:218), Crumlin, Co. Dublin, P.E.R., March, 1940. Other specimens from the same host species were taken at Monkstown, Co. Dublin, by A.E.W. in March, 1940.

National Museum of Ireland,

Kildare Street, Dublin.

July 2nd, 1940.

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*Orchopeas wickhami* Baker (*Siphonaptera*) in Ireland.—While examining some flea records collected by A. D. Middleton for his study on the grey squirrel (*Sciurus carolinensis* Gmelin) in the British Isles (*Proc. zool. Soc. Lond.*, 1930: 809-43) I found a record of four specimens of *Orchopeas wickhami* Baker taken from a female squirrel at Castle Forbes, Co. Longford, 29.xi.1930. Castle Forbes is probably the only area in Ireland in which the grey squirrel has been introduced, the original specimens coming from Woburn in 1913. The flea is

specific to the grey and other squirrels in North America and was first recorded in England by Donisthorpe (1925, Ent. Rec., 37:163) from a grey squirrel drey in Windsor Great Park.—R. B. FREEMAN, Bureau of Animal Population, University Museum, Oxford: July 11th, 1940.

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ON *RHAGIUM BIFASCIATUM* F. AND ITS VARIETIES  
(COL., CERAMBYCIDAE).

BY K. G. BLAIR, D.SC., F.R.E.S.

In a recent paper (*Naturalist*, 1940: 147-9) Mr. R. R. U. Kaufmann brings forward *Rhagium bifasciatum* F. ab. *infasciatum* Pic as an aberration new to Britain, but the form in question has unfortunately been misidentified. As various other inaccuracies appear in Mr. Kaufmann's paper, and old errors are repeated that have already been corrected, while numerous important works dealing with the species are omitted from his imposing Bibliography, a brief review of the position may not be inopportune.

The species is well known for the wide range of variation in elytral pattern that it exhibits, a variation that has little to do with distribution: e.g. Simon (1939) figures ten forms from one locality in France, while similar series could be collected in many a British locality where the species is plentiful. British collectors have, however, paid little attention to the names that have been given to these numerous forms. Marsham (1802), it is true, described as species three very distinct forms, but Stephens (1831), correctly recognising them as merely varieties of *bifasciatum*, sank them as such without even retaining their names; these have for the most part been lost sight of in literature until duly reinstated by Aurivillius (1912). Three specimens now in the Stephens Collection, though lacking labels of any kind, agree well with Marsham's descriptions and are believed to be his types.

The normal form of the species has two oblique yellow spots on a dark ground on each elytron, one before and one behind the middle, while there is also a considerable amount of dull red colour along the sides and at the apex of the elytra. Variation consists largely in the reduction or increase in size of these yellow spots which may on the one hand be reduced, divided or obliterated, or on the other hand be enlarged to such a degree as to unite and occupy almost the entire elytra. Thus the anterior spot may be divided into two (var. *histrinotatum* Pic, 1914) or reduced to some indistinct antemedian spots, the red colour being limited to the extreme apex (var. *infasciatum* Pic, 1898); or the marginal red may encroach upon and obliterate the posterior spot (var. *uni-*

*fasciatum* Muls., 1839). The red may then occupy the whole of the middle area of the elytra (var. *bicolor* Oliv., 1795) or even the entire elytra except for a narrow dark margin at the base (var. *rufum* Prell, 1908). Of this type of variation I have not hitherto seen examples in British material, though reduction in size of all four spots is not uncommon, in some cases the anterior spot being crossed by a narrow black line, thus approaching var. *bistri-notatum*, though hardly, I think, closely enough to be so called.

Variation by enlargement of the spots occurs on the other hand to an extreme degree. This may be by the prolongation backwards near the suture of the anterior spot until it unites with the posterior (var. *gravei* Hubenth., 1902). If this connection be broad we have var. *connexum* Everts, 1918 (see Heller 1912, fig.), though this name was subsequently (1922) considered by its author to be synonymous with *gravei*, until with the disappearance of the apical dark patch we have var. *bimaculatum* Marsh., 1802. Otherwise the yellow spots may be enlarged until each meets its fellow on the suture, leaving a complete median dark band between them, though the suture itself remains narrowly black (var. *latefasciatum* Pic, 1891 = *fasciatum* Pic, 1898). This band may be broken up into short longitudinal lines (var. *nigrolineatum* Donovan., 1801 = *medionotatum* Pic, 1910), or may disappear altogether, leaving base and apex broadly dark (var. *ornatum* Fab., 1775 = *dorsale* Marsh., 1802 = *ecoffeti* Muls., 1839). When the median band remains entire but the yellow beyond it extends to the apex we have var. *lituratum* Fugn., 1891. The anterior yellow patch may also extend almost to the base, giving a variety of which there are examples in several collections and which appears to be var. *mediofasciatum* Pic, 1912 (Winkler, 1929). The median band itself may disappear leaving only a broad basal dark patch on each elytron, the rest being yellow. This would appear to be Kaufmann's *infasciatum* and is figured by Simon, 1935 (fig. G) and may be called var. *simoni* nov. Finally even the basal patch disappears leaving the elytra practically entirely yellow (var. *ictericum* Schleich., 1924 = *levisi* Dayr., 1935).

I have followed Heller's interpretation of *bicolor* Olivier rather than that of Aurivillius, this author considering it synonymous with *ornatum* F.; in other respects I adopt the synonymy given by Aurivillius. It must, however, be understood that the above forms are by no means sharply defined, but may pass gradually from one into another with frequent intermediate forms. In the same way forms that are here regarded as synonymous may actually present

slight differences though such are not held to be of an importance sufficient to warrant the retention of the name.

The material examined by me includes in addition to the collections in the British Museum (Nat. Hist.), series from the private collections of Messrs. S. R. Ashby and J. R. le B. Tomlin, to whom I must express by grateful thanks for their kindness in allowing me to look over them. Doubtless when further material is examined some of the forms that I have noted as not yet having been seen by me will be discovered. The specimens of the different forms actually examined are distributed as follows:—

*v. gravei* Hubenth.—1 ♂ 2 ♀ Woking, Surrey (Coll. G. C. Champion); 1 ♂ (Stephens Coll.); 1 ♀ (Brit. Mus. Coll.); 1 ♀ New Forest, Hants., 1 ♀ Chartley Moss, Staffs., 1 ♀ ex Shepherd Coll (Coll. J. R. le B. Tomlin), 1 ♂ Oxshott, Surrey (Donisthorpe Coll.).

*v. bimaculatum* Marsh.—2 type (Stephens Coll.).

*v. latefasciatum* Pic.—1 ♀ Oxshott, Surrey (K.G.B.).

*v. nigrolineatum* Donovan.—1 ♀ (Stephens Coll.); 2 ♀ (Brit. Mus. Coll.); 1 ♀ (Sharp Coll.); 2 ♀ Hurtwood, Surrey, 1 ♀ purchased at Stevens' sale (Coll. G. C. Champion); 1 ♀ Windsor, Berks (Donisthorpe Coll.); 1 ♀ New Forest, 1 ♀ Rickmansworth, Herts. (Coll. S. R. Ashby); 1 ♂ Manchester district, Lancs. (Coll. J. R. le B. Tomlin).

*v. ornatum* F.—1 ♂, type of *dorsale* Marsh. (Stephens Coll.); 1 ♂ Weybridge, Surrey, 1 ♀ no loc. (Brit. Mus. Coll.); 1 ♂ 1 ♀ Hurtwood (Coll. S. R. Ashby); 1 ♂ 2 ♀ New Forest (Coll. J. R. le B. Tomlin).

*v. lituratum* Fugn.—1 ♀ (Brit. Mus. Coll.); 1 ♂ 1 ♀ purchased at Stevens' sale (Coll. G. C. Champion); 1 ♀ Delamere, Cheshire, 1 ♀ ex Crotch Coll. (Coll. J. R. le B. Tomlin).

*v. mediofasciatum* Pic.—1 ♂ 1 ♀ (Stephens Coll.); 1 ♂ (Brit. Mus. Coll.); 2 ♀ purchased at Stevens' sale (Coll. G. C. Champion).

*v. simoni* nov.—1 ♀ New Forest (Donisthorpe Coll.); 1 ♂ ex Crotch Coll. (Coll. J. R. le B. Tomlin).

*v. ictericum* Schl.—1 ♂ 1 ♀ (Brit. Mus. Coll.); 1 ♂ north of England (Brit. Mus. Coll.); 1 ♂ New Forest (Donisthorpe Coll.); 1 ♂ 1 ♀ Hurtwood (Coll. S. R. Ashby); 1 ♂ Albury, Surrey (Coll. G. C. Champion); 1 ♂ Killin, Perthshire (Coll. K. G. B.).

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[References given by Aurivillius or by Kaufmann are not repeated here.]

AURIVILLIUS, C. (1912). In Junk, *Col. Cat.*, pars. 39 (Cerambycidae).

HELLER, K. M. (1912). *Ent. Rundsch.*, 1: 109. [Fig. *gravei* (near).]

PIC, M. (1914). *Longic.*, 9: 3 and 19.

EVERTS, E. (1918). *Ber. Ent. Ned. Ver.*, 5: 73.

— (1922). *Col. Neerl.*, 3: 403.

SCHLEICHER, H. (1924). *Ent. Anzeig.*, 4: 38.

WINKLER, A. (1929). *Cat. Col. reg. Palaearct.*: 1146.

DAYREM, J. (1935). *Misc. Ent.*, 36: 25.

SIMON, A. (1939). *Misc. Ent.*, 40: 16-17. [10 figs. without names]

British Museum (Natural History),

London, S.W.7.

August 5th, 1940.

A NEW BRITISH LEAF-ROLLING SAWFLY OF THE GENUS  
*PONTANIA* COSTA ON *SALIX PENTANDRA* L. (HYM., SYMPHYTA).

BY ROBERT B. BENSON, M.A., F.R.E.S.

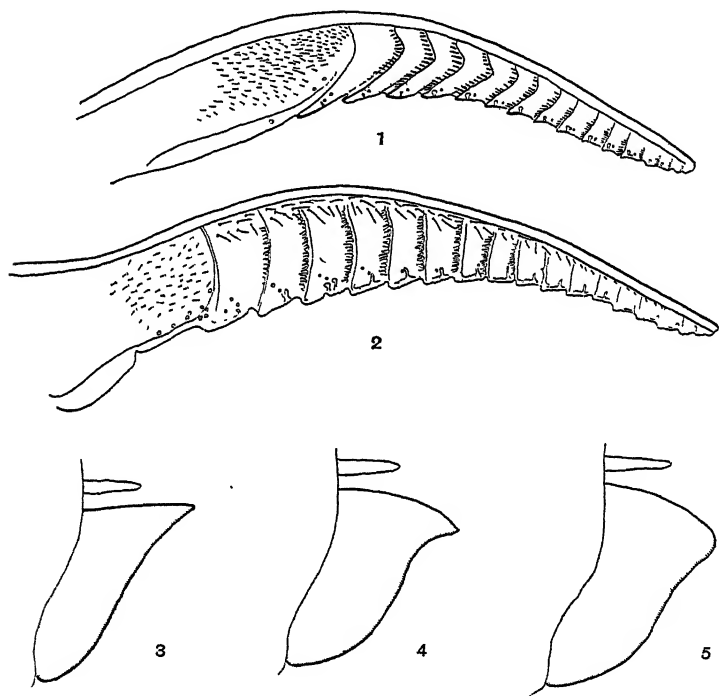
Near Grantown-on-Spey, Moray, in June, 1934, I found a few leaves of *Salix pentandra* L. with rolled edges containing young larvae of a *Pontania* species. These were unfortunately too immature to attempt to breed. In June of the following year, 1935, I collected several specimens of a *Pontania* species that were flying about and ovipositing on *S. pentandra* L. at Arolla, Valais, Switzerland, 8,000—8,500 ft.; these were determined as *P. leucapsis* Tischbein by Otto Conde to whom I sent all my Swiss Nematinae when he was preparing his monograph of the palaearctic representatives of this group. At the end of June this year, 1940, when visiting Newcastleton, Roxburghshire, I searched *S. pentandra* L. on the banks of the river Liddel and again found rolled leaves containing very young larvae, but I also found one adult female that differed from typical *P. leucapsis* Tischb. (on *Salix atrocinerea* Brot., etc.) in the same way that my Swiss specimens did. These specimens apparently represent an undescribed species. This is the third recent addition to the British leaf-rolling *Pontania* Costa. The other two were *P. purpureae* Cameron on *Salix purpurea* L. (Benson, 1938) and *P. nigrolineata* Cameron on the common osier (*S. viminalis* L.) (Benson, 1940). *P. purpureae* Cameron, 1884, would run in Enslin's key (1912—1918: 347-8) to *P. fibulata* Konow, 1901. The other two would run to *P. leucapsis* Tischbein and can be separated from that species as follows:—

1. Face with the raised ridge between the antennal sockets and the eyes dull with fine surface sculpture; ♀ sawsheath in profile mucronate apically with an almost straight upper margin right to the apex (fig. 3), and viewed dorsally with the hairs directed more backward (see Benson, 1940: 89, fig. 2); saw (fig. 1); ♂ apical sternite piceous and opaque. [Dark species with the stigma fuscous on its apical third to half and the costa infuscate apically; the temples, pronotum and hind femur are mostly black. Larva (Cameron, 1882, pl. vii, fig. 11, and 1885: 194-5 and pl. xi, fig. 7) in rolled leaf-edges of *Salix viminalis* L.] .....  
*anglica* Cameron, 1877 (= *nigrolineata* Cameron, 1879) new synonymy.
- Face with the raised ridge between the antennal sockets and the eyes shining and impunctate; ♀ sawsheath in profile hooked apically though the actual apex may be rounded; the upper margin is curved downwards apically (figs. 4 and 5); viewed dorsally the hairs on the sawsheath are directed more outwards (see Benson, 1940: 89, fig. 1); saw (fig. 2); ♂ apical sternite testaceous and transparent ..... 2
2. Ridge between the eyes and the antennal sockets is strongly defined, curves inwards behind the antenna and continues right to the sides of the frontal area, being carinate all the way; clypeus very strongly excised in the



middle where its length is only one-fourth to one-fifth the length of the labrum; sawsheath in profile not acute apically (fig. 5). Genae, supra-clypeal area, temples, pronotum, hind femur and tarsus mostly all black. Larvae in rolled leaf-edges of *Salix pentandra* L. .... *carinifrons* sp.n.

- Ridge between the eyes and the antennal sockets is less strongly defined and together with its carina breaks down before reaching the sides of the frontal area; clypeus less strongly excised in the middle where its length is half to one-third the length of the labrum; sawsheath in profile usually acute apically (fig. 4); genae, supra-clypeal area, temples, pronotum, hind femur and tarsus often more or less marked with yellow or white. Larvae in rolled leaf-edges of *Salix atrocinerea* Brot., *S. Caprea* L. and *S. aurita* L. .... *leucapsis* Tischbein.



FIGS. 1—2. Saws; 1, *Pontania anglica* Cameron; 2, *P. carinifrons* sp.n.  
FIGS. 3—5. Sawsheaths in profile; 3, *P. anglica* Cameron; 4, *P. leucapsis* Tischbein; 5, *P. carinifrons* sp.n.

### ***Pontania carinifrons* sp.n.**

♀. Black with the following parts yellowish-white: labrum, clypeus, mandible, spot on gena, tegula, hind corner of pronotum, trochanters, extreme apex of femora, tibiae (though these are more or less piceous above and apically, especially on the hind legs) and the basal tarsal segments of the front and middle legs.

Wings hyaline; stigma white with a yellow front margin and black apical margin; venation piceous except at the base of the wings and the apex of the costa which are yellowish-white. Length 4 to 4.5 mm.; forewing 4.5 to 5 mm. Punctuation absent from face up to the carina above the antenna; frontal area, temples, above and behind, and thorax above dull with dense surface sculpture; abdomen dull and coriaceous above; rest of insect mostly impunctate. Head with the clypeus very strongly excised in the middle where its length is but one-fourth to one-fifth the length of the labrum; ridge between antennal socket and eye is very prominent and carinate and continues right back curving inwards to join the carina surrounding the frontal area; median fovea deep and rounded not communicating behind with frontal fovea; antenna about 3.2 mm. and as long as a forewing from the base to the middle of the stigma. Thorax with the hind tibia slightly longer than the tarsus (1:1.05) and the basal tarsal segment about equal to the three following segments. Abdomen with the sawsheath in profile almost hooked though the actual apex is rounded and its upper margin is curved down apically (fig. 5); sawsheath in dorsal view as in *P. leucapsis* Tischbein (see Benson, 1940:89, fig. 1); saw as in *P. leucapsis* Tischbein (fig. 2).

♂ as in ♀ except in the antenna which is slightly longer (reaching from base of forewing to apex of stigma) and in the genital segments. The last apical sternite is testaceous and transparent as in *P. leucapsis* Tischbein and the genitalia have not been distinguished from those of that species.

SCOTLAND, Roxburghshire, Newcastleton, 1 ♀ (holotype), collected from *Salix pentandra* L. on bank of River Liddel, 23.vi.1940, R.B.B.; Stirlingshire, Clober, 1 ♀, Cameron Coll., B.M., 1896-76. SWITZERLAND, Valais, Arolla, 17 ♀♀, 13 ♂♂ (including allotype) collected from *Salix pentandra* L., 28.vi.1935, R.B.B. (det. *Pontania leucapsis* Tischbein by Conde). NORWAY, Finmarken, Seiland Isle, 1 ♀, vi.1934, D. Vesey FitzGerald (det. *Pontania leucapsis* Tischbein by Conde).

#### LIST OF THE KNOWN FOOD PLANTS OF THE BRITISH LEAF-ROLLING SPECIES OF *PONTANIA* COSTA.

<i>Salix pentandra</i> L.	<i>Pontania carinifrons</i> sp.n.
<i>S. fragilis</i> L., <i>alba</i> L. and <i>triandra</i> L.	<i>P. puella</i> C. G. Thomson
<i>S. purpurea</i> L.	<i>P. purpureae</i> Cameron
<i>S. viminalis</i> L.	<i>P. piliserra</i> C. G. Thomson
	<i>P. scotaspis</i> Förster
	<i>P. anglica</i> Cameron
	(= <i>nigrolineata</i> Cameron)
<i>S. atrocinnerea</i> Brot., <i>aurita</i> L. and	<i>P. leucapsis</i> Tischbein
<i>Caprea</i> L.	<i>P. leucosticta</i> Hartig
<i>S. phyllicifolia</i> L., etc.	<i>P. ?</i> sp.

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Department of Entomology,  
British Museum (Natural History),  
London, S.W.7.  
July 16th, 1940.

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AN INTERESTING SPECIMEN OF *POLYGONIA C-ALBUM* (L.)  
(LEP., NYMPHALIDAE).

BY G. D. HALE CARPENTER, D.M., M.B.E.  
(Hope Professor in the University of Oxford).

(PLATE III.)

I am indebted to A. C. Lowe of St. Edward's School, Oxford, for an opportunity of seeing a rare aberration of the 'Comma' captured by him on July 7th, 1940, in Waterperry Wood, Oxon. It is a male of the form named ab. *suffusa* by Frohawk (1938, Varieties of British Butterflies, Pl. 24, fig. 4), but the confluence of black spots is more pronounced.

This specimen has the three black costal areas of the fore-wing united into a single patch of which the composite origin is only faintly indicated by a small notch in the posterior margin of the patch showing where the proximal spot ends and the mid-costal spot begins. The two spots on the inner margin in area 1 b are fused into a single bar connected anteriorly with the spot at the base of area 2: the outer end of this bar is connected anteriorly to the outer and posterior corner of the anterior black patch by a black line parallel with the outer margin. The black around the concavity of the outer margin is much as in Frohawk's picture. The hind-wing is as figured by Frohawk. The under-surface is very dark from the bases to a point corresponding with the outer edge of the black patches on the upper side. In addition a black promontory runs out along the longest 'tail' of the hind-wing, and black surrounds the concavity of the fore-wing.

A specimen of this aberration, like Frohawk's, but not so complete as Lowe's, was reported by Miriam Rothschild and Malcolm Spooner (1938, *Nov. Zool.*, 41:125, Pl. III, figs. 1 and 2) as being only the second recorded from Great Britain. Miss Rothschild's specimen shows the clear imprint on the wings of the jaws of a lizard. The account of this specimen comments on the abnormal form of the white mark on the underside: in the Oxford insect this mark departs still more from the 'Comma,' having its posterior angle drawn out into a sharp point extending further than in Miss Rothschild's specimen. A further example taken at Hell Coppice, Bucks., on August 17th, 1938, by W. F. Burrows is recorded in 1940, *Proc. Ashmol. nat. Hist. Soc.*, 1939: 32. Hell Coppice and Waterperry Woods are in close proximity, but in different counties.



Imperial Forestry Institute, Oxford, *photo.*]

[To face page 212.

SIMILAR ABERRATION IN THREE SPECIES OF VANESSINAE.





The most interesting point about this aberration is that it also occurs in allied species. The specimen of *Nymphalis polychloros* (L.) and the two *Aglais urticae* (L.) figured show the same condition, and in both sexes of *urticae*. Another male of the same aberration, taken in 1876 near St. David's, S. Wales, is also in the Oxford Museum. The aberration seems to be of greater rarity in *N. polychloros*, of which Frohawk says (*op. cit.*:91) 'striking aberrations are a rarity,' and this one is not mentioned by him. It may be considered as a parallel variation due to similar genes occurring in the three species. In such cases it would simplify nomenclature to use the same name for the variation in whatever species it may occur.

#### EXPLANATION OF PLATE III.

FIG. 1.—*Polygonia c-album* (L.) ab. *suffusa* Frohawk, ♂, A. C. Lowe, Oxon., Waterperry Wood, 7.vii.1940. Deposited in Oxford University Museum.

FIG. 2.—*Aglais urticae* (L.) ab. *ichnusioides* Selys-Long., ♀, Hon. G. J. Parsons, Ireland, King's Co., Parsonstown, Birr Castle, probably viii.1886. Oxford University Museum. (See also 1928, *Trans. Ent. Soc. Lond.*, 76:524, Pl. XXII, fig. 18.)

FIG. 3.—*A. urticae* (L.) ab. *ichnusioides* Selys-Long., ♂, purchased as freak from Merrifield without data, probably from Continent. Oxford University Museum.

FIG. 4.—*Nymphalis polychloros* (L.) ab. *testudo* Esper, ♂, data as for fig. 3. Hope Department of Entomology, Oxford University Museum.  
August 15th, 1940.

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*The Immature Stages of Noterus capricornis* Herbst. (Col., Dytiscidae).—The habits of the immature stages of this genus have long been an enigma to Coleopterists. The first account of the first instar is given by Meinert (1901, *K. danske vidensk. Selsk. Skr.*, 9:414, pl. vi, figs. 150-157), from specimens obtained from the eggs of *N. clavicornis* Degeer. Wesenberg-Lund (1912, *Int. Rev. Hydrobiol.*, Biol. Suppl. 5:54) described the adult larva from ten specimens obtained by himself and Böving in the mud in very shallow water, material obtained after a very long search. These were identified by comparison with Meinert's description of the first instar. G. W. Müller (1922, *Mitt. naturw. Ver. Greifswald*, 48 and 49:46) also found larvae which he assumed to be *N. clavicornis* Deg. as being slightly distinct from those described by Wesenberg-Lund. These were found at the roots of aquatic plants and he assumed that they obtained their oxygen by piercing the roots of plants with the pointed posterior spiracular process. The larva was figured by Böving and Craighead (1931, *Ent. Amer.*, 11: pl. 5, figs. K, L, N—P).

Both my father and I myself have frequently searched for the larvae of this genus, but until this year it has always eluded our efforts. On August 6th, while collecting in a ditch to the west of Lye Pool, West Sussex, I had the good fortune to take a single larva which was recognised in the field. The next sweep with the net was negative and on reflection it was remembered that the

successful sweep had run close to a root of *Iris* floating on the surface, uprooted just previously by my father. Accordingly I pulled up a further root, and after washing it in the net the contents were turned on to the collecting sheet and a second larva was obtained. Further joint search produced two further larvae. The next day we returned to the Lye Pool itself and, adopting the same technique on the roots of *Sparganium* our joint efforts were rewarded by the capture of about forty larvae and ten cast skins. On this occasion two larvae were obtained partially hidden each in a small case that suggested a seed capsule. The significance of this was not at the time appreciated.

The next day, at Piltdown Pool, East Sussex, other collecting proving of little interest, we searched for further larvae of *Noterus* with slight success. In the course of this my father noticed numerous small round globules floating to the surface. Some of these, on examination, were found to contain Coleopterous pupae and subsequent examination of a number of these brought home produced the fully-grown larvae, pupae and completely immature specimens of this species.

The technique to be adopted is to pull up the plants of *Iris*, *Sparganium* and *Juncus* in water up to about eighteen inches deep, wash them vigorously in the net and examine the contents turned out in a little water on the sheet. The material on the sheet is vigorously agitated and the larvae will be found to float to the surface, when, being slightly 'greasy,' they are trapped in the surface film, unless they can obtain a foothold by which to crawl again beneath the surface. Up to ten larvae were obtained from a single root. This method also produced a few larvae of *Dryops* sp. which were, at first, mistaken for *Noterus* larvae, but it was noticed that they do not have the same greasy habit as the *Noterus* and do not float in the surface film. The *Noterus* larvae are very rapid movers beneath the surface and quickly disappear among any debris there may be. A fuller account of the larva and pupa of *Noterus capricornis* is in preparation.—JOHN BALFOUR-BROWNE, Roualeyn, Trefriw, Carnarvonshire: August 14th, 1940.

*Lyte reducta* Hagen (Trich., Psychomyiidae) in Oxfordshire.—Two specimens of this rare species were detected by Mr. M. E. Mosely among material collected by my son, A. D. Grensted, at Headington, Oxford, on July 15th of this year. Others have since been taken in the same locality. This is not only a new county record, but a considerable extension of the known range of the species in this country. Hitherto the only well-authenticated examples were those taken by myself and my boys in Somersetshire, near Minehead, and in Shropshire.—L. W. GRENSTED, Oriel College, Oxford: August 12th, 1940.

## Society.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: May 23rd, 1940.—Mr. J. O. T. Howard, Vice-President, in the chair. Mr. C. N. Hawkins exhibited a sprig of *Salix caprea* L. with growths resembling catkins, with leafy structures having stamens with anthers between them. Mr. F. D. Coote, the Bird's Nest Orchid found at Bookham on a clay subsoil; ova of *Hamearis lucina* L.; and ova of *Callophrys rubi* L. laid in the tip shoots of *Helianthemum*. Mr. V. August, a larva of *Apatura iris* L., N.W. Sussex. Mr. T. R. Eagles, the fungus, *Polyporus sulphureus* Fr. on yew, Enfield, and young larvae of *Lycanopsis argiolus* L. on buds of *Cotoneaster*. Mr. W. H. A. Harris read notes on the early stages of *Stauropus fagi* L., and various Lepidopterous larvae with parasites. Mr. A. Bliss, a larva of *Crocallis elinguaris* L. unusually marked

on the abdominal somites, and a larva of *Lithosia lurideola* Zuck. Mr. S. N. A. Jacobs, a pest of stored and growing grain, *Sitotroga cerealella* Oliv. Mr. S. Wakely, larvae of *Semiothisa brunnata* Thnbg., Blair Athol. Mr. E. E. Syme, alate-apterous forms of *Microdon eggeri* Mik. (Dipt., Syrphidae) and discussed the development of wings in this species.—HY. J. TURNER.

## Reviews.

### \* MONOGRAPH OF THE SOUTH AMERICAN WEEVILS OF THE GENUS *CONOTRACHELUS*.'

By DR. KARL FIEDLER. 8vo, 365 pp., 1 pl., 57 figs. London (British Museum (Natural History)). 1940. Price 15/-.

Dr. Fiedler has already done much valuable systematic work in revising a number of South American genera of the difficult subfamily Cryptorrhynchinae. This monograph is his most ambitious undertaking, for *Conotrachelus* is far the largest and most heterogeneous genus in the group. No less than 547 species are described, of which 404 are new. Dr. Fiedler reckons that the total number of South American species will be about 720; but when it is considered how little is known of the vast Brazilian forests and that very few species have been included in this book from Argentina and southwards, and finally that there are still over a hundred undetermined species in the British Museum collection alone, it is clear that this figure is far too low. The writer would regard even 2,000 species as a very conservative estimate for the *Conotrachelus* of South America. A really critical examination of his large material would have been a very lengthy task, and Dr. Fiedler has frankly adopted in his keys an artificial system originally proposed by Schönherr, merely for the purpose of facilitating identification. The keys must, therefore, be used with discrimination, and it has been found that several species have been misplaced, evidently owing to failure to examine important characters of the mesosternum in carded specimens. Nevertheless, this book will be of great practical value to those who have to identify species in this unwieldy and puzzling genus. The illustrations by Miss Tassart are excellent.—GUY A. K. MARSHALL.

### ' THE FRANCIS WALKER TYPES OF TRICHOPTERA IN THE BRITISH MUSEUM.' Re-described and figured by CORNELIUS BETTEN, Ph.D., and MARTIN E. MOSELY, F.R.E.S., F.Z.S. 4to, pp. ix + 248, 1 pl., 122 figs. London (British Museum (Natural History)). 1940. Price 15/-.

The confusion caused by Walker's descriptions of species in the long series of British Museum Catalogues which were issued between 1844 and 1873 is notorious. This volume effectively clears up one corner of the mess, that relating to the Trichoptera. All the material in the British Museum collection used by Walker in his description of the species which he has named has been re-examined, re-described, and adequately figured, after comparison with more recent specimens. The nomenclature has been examined and fixed, and type-specimens indicated. Of the 180 specimens used by Walker it has been possible to make use of 171, which are placed in 50 genera and 101 species. 78 of Walker's names are retained, 21 are sunk as synonyms, and two are found to be preoccupied, new names being assigned. This full re-description and figuring of Walker's types, together with the adequate preservation of the specimens for future reference, is of special importance for North American entomology, and Professor Betten's collaboration with Mr. Mosely has been a happy one. Walker's original list formed the first basis of an arrangement of the North American species, and 76 of the species included in this survey are from Canada and the United States. Thus the publication of this volume effectively secures



the central positions in the effort to settle the difficulties 'which have vexed American Trichopterists for so many years.' Undoubtedly, as the authors themselves say, further problems remain, but this preliminary piece of work was a necessity, and now that it has been so thoroughly done, those who attack them will at least have no undefended positions in their rear.—L. W. GRENSTED.

'THE NEW SYSTEMATICS.' Edited by JULIAN HUXLEY for the Association for the Study of Systematics in relation to General Biology. 8vo, pp. viii + 583, illustrated. Oxford (Humphrey Milford, Oxford University Press). 1940. Price 21/-.

A Linnean description took but a few lines, while the hypermodern counterpart takes at least several pages and calls upon the services of statistician, physiologist, ecologist, chemist, cytologist and geneticist. In the collection of essays brought together in this book twenty-one specialists discuss some of the problems created by the wider conception of taxonomy which has obtained currency during the past few decades, and suggest lines of study which are likely to yield profitable results. As Dr. Ramsbottom points out in his essay on 'Taxonomic problems in fungi' (p. 411), 'the suggestion that there is a "new systematics" is surely without foundation. The aim of taxonomy has always been twofold—the identification of organisms, and their arrangement in a systematic manner to show affinities. The fact that as biological knowledge progresses its results are gradually absorbed by taxonomy, and that this often causes different methods to be adopted in classification, is merely a continuation of traditional procedure.' Unfortunately the process of absorption is all too gradual, but no doubt the publication of this admirable volume will do much to speed up the process.

'NEW BILINGUAL CATALOGUE OF THE BRITISH LEPIDOPTERA.' By I. R. P. HESLOP, M.A., F.R.E.S., F.R.G.S. 4to, 132 pp. Cambridge (W. Heffer and Sons, Ltd.). 1940. Price 6/-.

This catalogue, originally published in 1938 and now re-issued with the imprint of another publishing house, records 'the non-revised scientific nomenclature which is still the normal currency among the great majority of entomologists,' also the 'English names of all species other than those included in the "groups" Tortrices, Tineides and Nepticules.' The total number of species recognised as British is 2,160, but this estimate is certainly too high as it includes such doubtful claimants to a place as *Papilio podalirius* L., *Pyrameis huntera* F. and *Chrysophanus hippothoe* L. The appearance of this work emphasizes the need for a fully-indexed synonymic catalogue compiled in accordance with the International Rules of Zoological Nomenclature; should such a volume be produced we hope that it will be more convenient in form than the one now before us.

'A TEXT-BOOK OF ZOOLOGY.' By T. J. PARKER and W. A. HASWELL. Sixth edition revised by O. LOWENSTEIN, D.Phil., Ph.D. Vol. I, 8vo, pp. xxxii + 770, 733 figs. London (Macmillan & Co., Ltd.). 1940. Price 36/-.

This work was first issued in 1898 and has successfully passed through five earlier editions, facts indicative of very great merit. Indeed it would almost be true to say that no other single zoological text-book has proved so useful and so popular among University students. The text of the present edition has been extensively revised, with change of type and format, while there are 70 completely new figures, 82 replacements of discarded illustrations and smaller alterations in others. The section on insects is more satisfactory than the corresponding pages in previous issues, as the classification is more modern and illustrations from recent authorities such as Imms and Weber are included.

*Apatura iris* (L.) and *Colias croceus* (Fourc.) (Lep.) in North Hants.—A battered male *Apatura iris* (L.) was taken in a lane outside an oak coppice at Burghclere, N. Hants, at 4 p.m. (B.S.T.) on July 6th, 1940, when it happened to fly low. I have only seen the species here twice before, namely: a freshly emerged male on cow manure in my own meadow on July 14th, 1935, and a freshly emerged female in the same lane mentioned above on August 3rd, 1938. A fresh male *Colias croceus* (Fourc.) was observed in a clover field on August 4th, 1940, and another close by on August 5th; a third specimen of unknown sex was seen in the same place on August 16th, but none have been noticed since.—CAPT. ALBAN F. L. BACON, The Malt House, Burghclere, Newbury, N. Hants: September 5th, 1940.

RESULTS OF THE OXFORD UNIVERSITY EXPEDITION TO  
SARAWAK (BORNEO), 1932.—RHOPALOCERA (LEPIDOPTERA).

By B. M. HOBBY, M.A., D.Phil., F.R.E.S.

PLATE IV.

The butterflies recorded in this paper were collected between August and December, 1932, by the Oxford University Expedition to Sarawak, in which the late Mr. A. W. Moore and myself participated as entomologists. The list is short and incomplete, as very little attention was paid to this group; it includes records of only 416 specimens representing 114 species. A new Lycaenid subspecies, *Nacaduba sanaya thalia* Corbet, has already been described (1938, *Trans. R. ent. Soc. Lond.*, **87**: 134) and a new Satyrid subspecies, *Ptychandra schadenbergi talhoti*, is described below; most of the remaining species are already well known from Borneo, although there is a sprinkling of the less frequently encountered forms. A general account of the expedition with a map of the area visited was published by T. H. Harrison (1933, *Geogr. J.*, **82**: 385-410), and some of the ecological and botanical results are described by P. W. Richards (1936, *J. Ecol.*, **24**: 1-37, 340-60). The chief collecting stations are listed below and are subsequently indicated by the use of the key letters given in brackets.

Mt. Dulit: (S) Secondary forest in the vicinity of the base camp at the foot of the range, *i.e.* on its north-eastern side where the River Tinjar receives the R. Lejok on its left bank (altitude less than 325 ft.).

(P) Primary 'mixed forest' along the trail leading from the base camp to the high camp.

(M) Primary 'moss forest' around the high camp at 4,000 ft.

(H) Primary 'heath forest' around the Koyan camp at 2,500 ft. on the south-western side of the range.

R. Kapah: (K) Primary 'mixed forest' near the River Kapah, a right-bank tributary of the Tinjar about half a mile below the Lejok (altitude little more than that of base camp).

A few specimens were also taken on Mt. Kalulong, 30 miles to the east of the base camp.

Without the kind and sympathetic co-operation of specialists at the British Museum (Nat. Hist.), it would have been impossible to prepare this report. In particular I wish to express my indebtedness and thanks to Dr. A. S. Corbet, who has identified the Lycaenidae, described a new subspecies, and supplied a note illustrated with a drawing of the genitalia of the rare *Celastrina boulti* Chapm.; Brig. W. H. Evans for identifying the Hesperidae; Mr. A. G. Gabriel for revising my determinations and supplying a detailed list; and to Mr. G. Talbot for advice on numerous matters and assistance in drawing up the description of the new Satyrid subspecies here dedicated to him.

A representative collection of the species obtained, including the types, is preserved in the British Museum (Nat. Hist.); the remainder are in the Hope Department of Entomology, Oxford University Museum.

#### LIST OF SPECIES.

DANAIDAE.—*Danaus aspasia shelfordi* Fruh., 1 H; *Ideopsis gaura daos* Boisd., 1 S; *Euploea ochsenheimeri aegyptus* Butl., 1 M; *E. diocletianus lowii* Butl., 8 S, 1 S on Mt. Kalulong.

SATYRIDAE.—*Ypthima f. fasciata* Hew., 1 S, 6 H; *Y. pandocus sertorius* Fruh., 1 S, 2 M, 6 H, 1 K; *Ptychandra schadenbergi talboti* ssp.n., 1 M; *Mycalopsis m. marginata* Moore, 1 M; *M. anapita fucentia* Fruh., 3 S; *M. amoena* Druce, 1 M; *M. horsfieldi hermana* Fruh., 2 S; *M. orseis borneensis* Fruh., 1 S; *M. m. maianensis* Hew., 1 P; *Ragadia makuta umbrata* Fruh., 2 S, 1 P on Mt. Kalulong, 1 H; *Melanitis leda ismene* Cram., 1 S.

AMATHUSIDAE.—*Faunis stomphax besa* Hew., 1 P; *Xanthotaenia busiris hurra* Stich., 2 S, 2 H; *Thaumantis noureddin chatra* Fruh., 1 S; *T. odana cyclops* Röber, 2 S.

NYMPHALIDAE.—*Cupha erymanthis nagara* Fruh., 1 S; *Vindula erota montana* Fruh., 3 S, 1 M, 2 H; *Cirrochroa emalea ravana* Moore, 1 S; *Terinos clarissa praestigiosa* Fruh., 3 S; *Cethosia h. hypsea* Doubld. and Hew., 2 S; *Symbrenthia hypatia hippocrene* Stgr., 1 S; *Doleschallia bisaltide borneensis* Fruh., 1 S; *Amnosia decora martini* Honr., 1 S; *Cyrestis cocles sericeus* Butl., 1 S; *C. nivea borneensis* Mart., 1 M; *Chersonesia r. rahria* Moore, 3 H; *C. p. peraka* Dist., 3 S, 2 H; *Neptis d. duryodana* Moore, 1 S; *N. n. nata*, Moore, 1 H; *N. hylas sopatra* Fruh., 3 S; *Pantoporia larymna elisa* Fruh., 1 H; *Limenitis procris agnata* Fruh., 2 S, 1 H; *Parthenos sylvia borneensis* Stgr., 1 S; *Tanaecia aruna pardalis* Voll., 2 S; *T. lutala crowleyi* Butl., 2 S; *Adolias c. canescens* Butl., 1 H; *Euthalia a. ambalika* Moore, 1 H; *E. diardi* Voll., 2 K; *E. monina bipunctata* Voll., ♂ f. *limbata* Fruh., 1 H; *Eulepis athamas uraeus* Roths. and Jord., 4 H; *E. delphis delphinion* Fruh., 1 K; *Charaxes polyxena repetitus* Butl., 1 S, 4 H.

RIODINIDAE.—*Abisara kausambi litavicus* Fruh., 1 P; *Zarax teneta* Hew., 1 H; *Laxita t. telesia* Hew., 1 S; *L. o. orphna* Boisd., 2 P.

LYCAENIDAE.—*Allotinus f. fabius* Dist. and Pryer, 1 S, 1 H; *Neopithecops zalmora horsfieldi* Dist., 1 P; *Celastrina melaena cowani* Cbt., 1 H; *C.*

*cossaea sonchus* H. H. Druce, 1 M; *C. plauta* H. H. Druce, 1 P, 1 M, 3 H; *C. d. doherlyi* Tytler, 1 M; *C. dilecta paracatius* Fruh., 1 P, 1 M; *C. musina lugra* Druce, 39 H; *C. camena strophis* Druce, 2 M; *C. boulti* Chapm., 1 M; *Castalius ethion icenus* Fruh., 1 M; *C. elna elvira* Hew., 1 S, 9 H; *Athene emolus goberus* Fruh., 2 S, 3 H; *Una usta* Dist., 4 H; *Lampides pura tenus* Fruh., 2 S; *L. celeno lawasa* Moulton, 1 S, 1 K; *L. alecto ageladas* Fruh., 1 H; *Nacaduba sanaya thalia* Cbt., 1 S; *N. a. akaba* H. H. Druce, 1 M; *N. berenice icena* Fruh., 1 S; *N. nora superdates* Fruh., 3 S, 2 P, 2 M, 2 H; *N. a. angusta* Druce, 1 S; *Catochrysops panormus perakana* Cbt., 2 S; *C. strabo riana* Cbt., 2 S; *Everes lacturnus rileyi* Godf., 1 S; *Zeltus etolus maximinianus* Fruh., 1 S; *Hypolycaena erylus teatus* Fruh., 3 H; *Amblypodia waterstradti* B.-Bak., 1 P; *Curetis hera jopa* Fruh., 2 S.

PIERIDAE.—*Delias ninus parthenia* Stgr., 1 M; *Cepora lea hespera* Butl., 4 S; *Appias cardena cardena* Hew., 1 M; *Catopsilia p. pyranthe* L., 1 S on Mt. Kalulong; *Eurema hecabe borneensis* Fruh., 7 S, 1 M, 2 H, 2 K; *E. a. ada* Dist., 3 S, 27 H; *E. tilaha gradiens* Butl., 3 S, 1 H; *E. tomima nabalua* Cbt. and Pend., 1 S, 1 H; *Gandaca harina elis* Fruh., 1 S, 1 P, 2 H.

PAPILIONIDAE.—*Troides b. brookiana* Wallace, 3 S, 44 H; *Papilio neptunus doris* Roths., 1 H; *P. aristolochiae antiphus* F., 1 S; *P. iswara araspes* Feld., 6 H; *P. fuscus dayacus* Roths., 1 S, 1 K; *P. acheron* Gr.-Sm., 12 H; *P. stratiotes* Gr. Sm., 16 H; *P. antiophates itamputi* Butl., 2 H; *P. empedocles* F., 1 M, 1 H; *P. s. sarpedon* L., 6 S, 5 H; *P. evemon eventus* Fruh., 1 S, 1 K; *P. procles* Gr. Sm., 6 H; *P. bathycles bathycloides* Honr., 9 H; *P. a. agamemnon* L., 3 S, 3 H.

HESPERIIDAE.—*Satarupa a. affinis* Druce, 1 H; *Celaenorrhinus ladana* Butl., 1 P; *Tagiades menaka waterstradti* Elw., 1 M, 1 H; *Ismene etelka* Hew., 1 H; *Iambrix latifascia* Elwes and Edw., 1 M; *Ismia protoclea* Herr.-Schäf., 1 S; *Koruthaialos rubecula laetitia* Plötz, 1 S; *Baoris conjuncta* Herr.-Schäf., 1 S; *Padraona dara ahastina* Fruh., 2 S; *Telicota a. augias* L., 2 M; *Notocrypta curvifascia restricta* Moore, 1 P, 1 H; *Kerana armata* Druce, 1 P, 1 H.

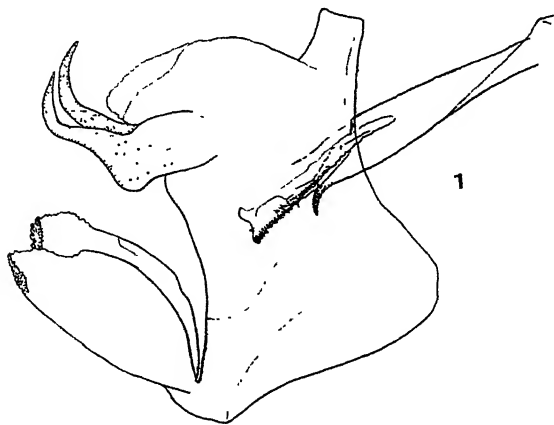


FIG 1.—Male genitalia of *Celastrina boulti* (Chapm.), Borneo, Sarawak, Mt. Dulit, 4,500 ft., moss forest, 14.x.32 (B. M. Hobby and A. W. Moore).

## LYCAENIDAE.

*Celastrinu boulti* (Chapm.).

*Notarthrinus boulti* Chapman, 1912, *Ent. mon. Mag.*, **48**:103, pl. vi, ♂, ♀ and ♂ genitalia; Sarawak, Mount Klingkang.

'Hitherto, this very rare species has been known only from two males and a female, but the Oxford University Expedition to Borneo obtained another male (SARAWAK, Mt. Dulit, 4,500 feet, moss forest, 14.x.1932, *B. M. Hobby and A. W. Moore*). This specimen is smaller than the type, and has the pale greyish-blue area on the upperside more extensive, with a consequent reduction in the black bordering. On the underside, the post-discal spots in spaces 1b and 2 on the forewing are faint, and the spots in spaces 1a and 1b on the hindwing are obsolete. This species falls in the *quadriplaga* group (genus *Oreolyce* of *Toxopeus*), in which vein 7 on the forewing arises immediately before the cell-end. The genitalia of the Mount Dulit specimen (fig. 1) are identical with those of the type.'—A. S. CORBET.

## SATYRIDAE.

***Ptychandra schadenbergi talboti* ssp. nov.**

Holotype, ♀ : SARAWAK, Mt. Dulit, Igok Peak, 4,600 ft., moss forest, 17.x.1932.—*B. M. Hobby and A. W. Moore*.

Distinguished from the *nomino*-typical form by the darker coloration, the more concentrated and sharply defined markings of the underside, and other characters enumerated below.

UPPERSIDE. *Forewing*.—Light markings reduced, especially the costal bar which is divided into three spots by the dark veins. Outer spot small as in some typical specimens of *P. s. schadenbergi*. Sub-apical comma-shaped mark vestigial. Discal white patch narrowed and pointed distally, whereas in *P. s. schadenbergi* the distal edge is straight; small stripe in area 3 shorter and narrower, stripe below vein 2 only represented by a thin streak. Cell-patch shorter and not extending to base. No sub-marginal light marks. All markings sharply defined. Fringes much darker brown. *Hind-wing*.—Tail less prominent. Eye-spots sharply defined, an additional small one in area 1c. White area more defined at the edges and proximally only extending in the cell to vein 2. Fringes greyish, interrupted by smoky-brown.

UNDERSIDE. *Forewing*.—Costal band larger than on upperside, extending to vein 4. Distal band of ocelli sloping towards tornus, narrower and bearing four sub-equal eye-spots, the two lower spots blind as in *P. s. schadenbergi* which has three unequal spots posteriorly not directed so far distad. Line enclosing these spots violet-tinged instead of yellow. Submarginal line similarly coloured, thinner and more dentate than the corresponding yellowish-white line of the allied species. White median patch as on the upperside, but not extending to the tornus as in most specimens of *P. s. schadenbergi*. Cell with two trans-

verse violet-tinged white bars, the proximal one anteriorly pointed, the distal one angled outwards at the middle. *Hindwing*.—Eye-spots larger than on upperside, with black centres and paler yellowish rings instead of brownish-yellow centres and deep yellow rings; outer rings violet-tinged instead of white; spot in area 4 smaller than the one above it and almost equal in size to the posterior one in area 1b; costal spot larger than any of the others, smaller than in *P. s. schadenbergi*. Basal half smoky-brown with a violet tinge. Cell with three transverse bands edged distally with violet-tinged white; the proximal one broader, middle one between veins 2 and 7 rounded on its inner edge, distal one more clearly edged with white and placed close to the preceding one leaving the distal part of the cell of the general ground colour, whereas in *P. s. schadenbergi* that part is occupied by a white patch. Area 7 with a small light patch at the base, tinged with violet, and edged with dark brown distally, followed by a brown patch outlined with violet-white except anteriorly, a transverse dark brown band, and a violet-tinged white patch. A light violet-tinged grey basal band posterior to the cell. Post-discal brown line more strongly marked and darker than in *P. s. schadenbergi*, forming close to the cell a well-defined anterior line of even width throughout, edged proximally with violet-tinged white, strongly excurved between veins 3 and 5. All these markings from the base to post-discal line form a basal, sub-basal and distal dark line; the sub-basal line, crossing the cell about the middle, is very irregular and curves distad posteriorly to join the post-discal line. The post-discal white band, outside the post-discal line, is broader above vein 4, incurved in area 3, extending to vein 2, and not reaching ocellus below vein 4. Submarginal line violet-tinged white, antemarginal line pale yellow.

Expanse 50 mm., length of fore-wing 24 mm.

According to M. Gaede (*Satyridae in E. Strand*, 1931, *Lep. Cat.*, 29:320) the genus *Ptychandra* C. & R. Felder contains only three species, viz. *P. caeruleans* Fruh. from Luzon (Philippines), *P. lorquini* Felder from Luzon, Basilan, Mindanao, Mindoro (Philippines) and Halmaheira (North Moluccas), and *P. schadenbergi* Semper from Mindanao (Philippines). The genus is thus primarily a Philippine one, and the new subspecies here recorded from Borneo provides an interesting extension of its range.

#### DISTRIBUTION OF PAPILIONIDAE IN THE MALAY ARCHIPELAGO.

In 1869 (*The Malay Archipelago*, London, 1: 229-30) Wallace made a census of the Papilionidae found in Borneo, Sumatra and Java, concluding 'that Java is more isolated from the two larger islands than they are from each other, thus entirely confirming the results given by the distribution of birds and mammalia, and rendering it almost certain that the last named island was the first to be completely separated from the Asiatic continent, and that the native tradition of its having been recently separated from Sumatra is entirely without foundation.' A similar enumeration (*op. cit.*: 437-9) of the Papilionidae of Celebes, supported by consideration

of the Pieridae, Nymphalidae, hawks, parrots and pigeons, etc., showed 'that this island is really one of the most isolated portions of the Archipelago, although situated in its very centre.'

The large size and gorgeous colouring of the swallow-tailed butterflies has led to their being collected more frequently than other insects; they are thus suitable for investigations of this nature, as Wallace recognised. Since his time, however, a number of new species have been discovered and the distribution of those previously known has been more fully investigated. It seems desirable, therefore, to test his conclusions in the light of modern knowledge, and at the same time the opportunity is taken of adding Malaya and the neighbouring islands of Palawan and the Philippines to the areas originally considered.

The following table, compiled from Bryk *in* Strand (1929-30), Lep. Cat., 24 (Papilionidae), shows the number of species of Papilionidae in Malaya and the chief neighbouring islands, the number confined to these regions, the latter number expressed as a percentage of the first, and the number of species common to any two of these regions.

	Malaya	Sumatra	Borneo	Java	Palawan	Philippines	Celebes
No. of species .....	43	42	43	31	27	26	28
No. of unique species ...	4	4	5	3	3	9	16
Percentage of unique species	9.3	9.5	11.6	9.7	11.1	34.6	57.1
Spp. common to any two areas.	Malaya .....	—	36	34	24	18	7
	Sumatra .....	—	—	33	25	17	6
	Borneo .....	—	—	—	23	19	7
	Java .....	—	—	—	13	6	7
	Palawan .....	—	—	—	—	14	6
	Philippines ..	—	—	—	—	—	7

The extreme faunistic isolation of Celebes to which Wallace drew attention is entirely confirmed, as 57 per cent. of its 28 species are unique. The Philippines also stand aloof with 35 per cent. of the 26 species unique, while Malaya (43 species), Sumatra (42), Borneo (43) and Java (31) show much closer affinities with one another (having 23 or more species common to any two areas) than with either the Philippines (no more than 11 common species) or Celebes (7 or less common species). Palawan (27 species), as might be expected from its position, has affinities with both Borneo (19 species in common) and the Philippines (14 species in common).

In the Malayan group the isolation of Java is confirmed, for whereas this island has only 31 species, Malaya and Borneo each have 43 and Sumatra 42. This view is further strengthened by the fact that (a) ten species common to Malaya, Sumatra and Borneo are entirely absent from Java, and (b) Java has only six Philippine species while Malaya and Sumatra have ten and Borneo eleven. Of the 31 Javanese species, Malaya has 24, Sumatra 25, and Borneo 23. In Wallace's day this close agreement was not so obvious on account of imperfect knowledge of the Sumatran species, for which some allowance had to be made.

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#### EXPLANATION OF PLATE IV.

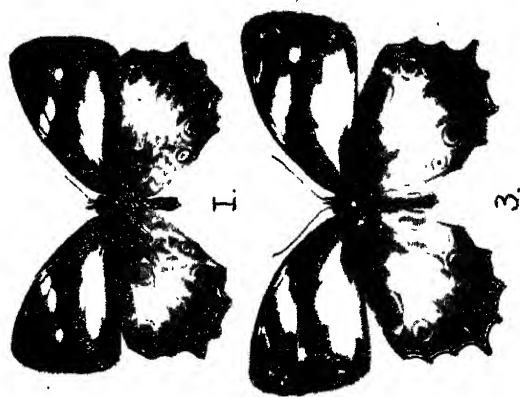
- FIGS. 1-2.—*Ptychandra schadenbergi talboti* ssp.n., holotype ♀, Borneo, Sarawak, Mt. Dulit, Igok Peak, 4,600 ft., moss forest, 17.x. 1932 (B. M. Hobby and A. W. Moore) (British Museum (Nat. Hist.)); 1, upperside; 2, underside.
- FIGS. 3-4.—*P. s. schadenbergi* Semper, ♀, Philippines, Mindanao, Crowley Bequest (British Museum (Nat. Hist.)); 3, upperside; 4, underside.

Hope Department of Entomology,  
Oxford University Museum.  
September 10th, 1940.

#### EXTENSIVE DESTRUCTION OF *PIERIS BRASSICAE* (L.) (LEP.) BY BIRDS.

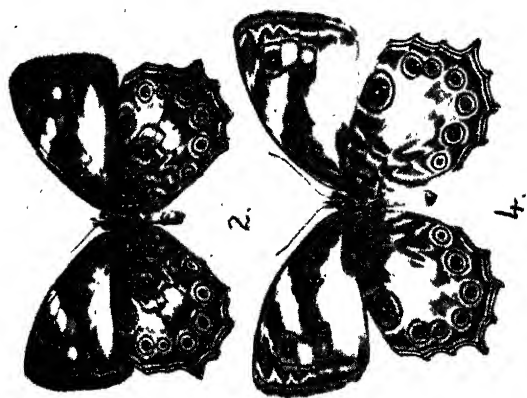
BY G. D. HALE CARPENTER, D.M., M.B.E.  
(Hope Professor in the University of Oxford).

The hordes of *Pieris brassicae* (L.) that appeared this summer have been the prey of birds to an extent noticed by many persons. Mr. A. H. Hamm, A.L.S., whose observations earlier in the year were recorded in *Nature*, Lond., 145:900-1, has been good enough to continue his careful studies during July and August in the same churchyard in East Oxford, and in part of Parks Road, a main thoroughfare between college gardens bordered by trees, with a grass strip on which the wings were found. The churchyard is about 200 yards square, intersected by gravel paths and bordered by limes and a few poplars: the majority of the wings were found on paths near the trees. It is noteworthy that on two visits to a park where borders of *Nepeta* in flower attracted very many *P. brassicae* and *Aglais urticae* (L.) the most diligent search failed to reveal any severed wings, probably because there were no trees or buildings near. The condition of the wings varied considerably: many were torn, but abrasions were seen at the base of nearly all



Imperial Forestry Institute, Oxford, photo.]

FIGS. 1-2.—*Ptychandra schadenbergi talboti* ssp.n., holotype ♀.



[To face page 224.

FIGS. 3-4.—*P. s. schadenbergi* Samper, ♀.



and some showed clear imprints of beaks, mostly corresponding with that of the house sparrow, but a few probably the result of attack by a starling.

TABLE I.—WINGS COLLECTED IN, AND AROUND, THE CHURCHYARD.

Date.	♂ Forewings.		♀ Forewings.		Hindwings.	Note.
	Right.	Left.	Right.	Left.		
1940						
20.vii	.....	3	3	5	4	7
23.vii	... ..	17	12	22	28	61
24.vii	.....	10	12	29	33	53 (1)
25.vii	.. ...	12	14	21	21	24
26.vii	.....	10	17	13	20	49
27.vii	. ....	5	3	7	9	18
28.vii	.. ...	22	20	27	25	62 (2)
29.vii	.....	23	20	30	25	48
30.vii	.....	23	19	26	31	56
31.vii	.....	17	18	32	30	50
1.viii	.....	25	18	29	26	82 (3)
2.viii	.. ...	10	8	25	30	53
3.viii	.. ...	27	25	37	47	113
4.viii	.....	4	5	11	10	25
5.viii	.....	11	10	16	13	36
6.viii	.....	26	33	26	23	97 (4)
7.viii	. ...	12	11	9	16	33 (5)
8.viii	... ..	15	13	22	14	58
9.viii	.....	9	6	11	9	29
10.viii	.. ...	14	12	17	12	30
TOTALS	.	295	279	415	426	984

To these records should be added the following notes concerning additional specimens:

- (1) A cock sparrow flew on to a path with a female *P. brassicae* fluttering in its beak: in less than one minute all the wings were nipped off and the body eaten.
- (2) A male *P. brassicae* on a path with head missing and wings mutilated, showing beak-imprints.
- (3) A female *P. brassicae* with abdomen missing, another female with head missing, another female with only the left wings attached to part of the thorax.
- (4) A female with head, abdomen and left forewing missing.
- (5) A male with half of the right hindwing missing.

These records show that from July 20th—August 10th at least 297 males and 429 females had been destroyed in the area concerned. In addition Mr. Hamm found damaged specimens of 26 *Pieris rapae* (L.), 2 *P. napi* (L.), 1 *Aglais urticae* (L.) and 2 *Abaxas grossulariata* (L.).

TABLE II.—WINGS COLLECTED IN PARKS ROAD.

Date. 1940	♂ Forewings.		♀ Forewings.		Hindwings.	Note.
	Right.	Left.	Right.	Left.		
24.vii .....	14	13	19	24	35	
26.vii .....	23	21	34	32	74	
29.vii .....	27	26	47	52	84	
31.vii .....	21	23	27	32	81	
2.viii .....	23	19	26	25	66	
5.viii .....	35	38	27	37	122	(1)
7.viii .....	31	37	20	27	87	(2)
9.viii .....	12	10	21	13	35	
TOTALS ..	186	187	221	242	584	

As in the previous case the following records should be added:

- (1) One female, minus head and most of body.
- (2) One female, minus head and tip of right forewing.

The total therefore indicates that at least 244 females and 187 males were destroyed along some 200 yards of road. In addition remains of 6 *P. rapae* and 3 *P. napi* were found.

Mr. Hamm states that in spite of the regularity of his visits to the churchyard, only once did he actually see a sparrow with a *P. brassicae*. The bird settled on the gravel path about four yards away with the insect fluttering in its beak; in less than one minute the wings were detached one by one and lying on the path. The bird did not once touch the ground with its victim or use its feet, but merely manipulated the prey with its beak, 'mumbling' it in its mouth until the wings were severed. This process obviously accounts for the rubbed bases of the wings and the comparative scarcity of imprints of beaks; for unless the butterfly had first been seized by a wing no clear mark would be impressed. Regarding trees, the experience of Mr. Hamm is borne out by my own observations and those of others. I visited with Mr. G. Talbot an area on Shotover Hill, Oxford, on July 22nd, where hordes of *P. brassicae* were flying about over a potato field, feeding on the flowers and ovipositing on young Cruciferous plants interspersed between the potatoes, probably the result of a previous crop. The hedges around the field bore enormous numbers of pupae, and ash and elm trees in the hedges were obviously used as perches and feeding places by birds, for wings were chiefly found on the ground under them. While watching I noticed sparrows constantly flying down from the trees and bushes into the potatoes, and saw one return to a bush with a fluttering *P. brassicae* in its beak which got away.

No attempts were made by the birds to catch butterflies actively flying. Other collections of wings were found under the lee of a hedge where a fine clump of *Stachys* in flower attracted many butterflies to settle.

Regarding the sparrows' methods of dismembering their prey, the following interesting notes on observations in Brighton have been received from Major H. Blackiston, F.L.S., of the Booth Museum. 'The sparrows have evolved two methods of attack — one from outside the *Buddleia*, attacking the butterfly on the wing, the second, hiding in the *Buddleia* and making a dart at a butterfly settled on the blossoms. Success seems 4 to 1 against the first method and 3 to 1 against the second. The percentage of successful attacks decreases as the breeze sways the blossoms: the birds then go down to within two feet of the ground and use the lower blossoms. The universal method of eating the captured butterfly seems to be as follows. The bird takes the victim under some rose bushes where he is safe from hungry and less agile fellows. He works on the butterfly, alive and feebly fluttering, until the head and thorax are well inside the beak, pointing down the throat; he then gives a gulp-bite and tears off all four wings simultaneously. It is but rarely that more than one bite is needed to separate wings from body. The captor then flies up to the roof to eat the body in about three pecks. My wife and I have watched this procedure for hours daily for five days: only twice did we see the victim carried off in flight with the wings not bitten off, and in these cases we had disturbed the birds. Those butterflies which settled on white *Phlox* with a background of white ramblers were completely immune from attack: only when the colours contrasted were attacks made. This has been happening all over the town and the whole area is littered with wings.' In a preliminary note Major Blackiston had written that in a neighbouring field 'the *brassicæ* settle like snowflakes and the starlings, sparrows, thrushes and blackbirds are busy morning till night and the grass is littered with wings.'

Mr. E. Dowsett has kindly sent the following note from Tring. 'On August 3rd, about 12.15 p.m., I noticed a number of *brassicæ* flying around a *Buddleia*: suddenly two blue tits darted at them and, seizing one each, detached the wings and devoured the body. Shortly after, two greenfinches appeared and did exactly the same.' Questioned as to the manner in which the tits removed the wings Mr. Dowsett replied: 'The *brassicæ* were grasped by the body while flitting from one blossom to another: the birds appeared to exert pressure first on one side and then the other, for two wings

fell each time. Perhaps the word 'mumbling' expresses it better, and they seemed to jerk the head as the wings fell. The whole procedure was very quick and neat, and the feet were not used.'

Mr. H. H. Bloomer, sending a consignment of wings from Swanage, wrote on August 5th: 'Hitherto I have not been convinced that birds in this country feed on butterflies, but the prevalence of these wings dotted about has made me look more carefully into the matter. In one small place between the summer house and a row of *Buddleia* there were dozens of wings on the ground, of which I send some. I was informed that sparrows had been seen chasing and capturing the butterflies. I watched in the garden and saw great tits chasing them about the flowering *Buddleias*: at last I had a clear view and saw one capture a white, bite off its wings and go away with the body. Among all the wings I have seen there was not one of a coloured butterfly, though these are also numerous this year.'

A consignment of wings sent to me from Harpenden, Herts., by Dr. C. B. Williams produced evidence, on comparison of the beak marks with the figures given by Collenette (1935, *Proc. zool. Soc. Lond.*, 1935: Pl. 1) that beside the birds already mentioned the following had eaten *P. brassicae*: pheasant, starling, spotted flycatcher, robin; and either yellow-hammer, meadow pipit, or chiff-chaff, of which the beak-marks are difficult to distinguish. Dr. W. E. Waller, of Rustington, Sussex, sent me a consignment of wings on which, besides the beak-marks of some of the birds already mentioned, there was the imprint of the beak of a partridge and a very short, broad one, most likely that of a swift. The consignment sent by Major Blackiston provided the following identifiable beak-marks: sparrow, 23; spotted flycatcher, 5; tit, 1; blackbird, 1; cuckoo, 1.

TABLE III.—SEXES OF BUTTERFLIES DESTROYED.

Locality, Date and Observer.	♂♂	♀♀
1. Oxford, Churchyard. v. A. H. Hamm . . . . .	54	24
2. Oxford, Churchyard. vii-viii. A. H. Hamm . . . . .	297	429
3. Oxford, Parks Road, vii-viii. A. H. Hamm . . . . .	187	244
4. Oxford, Shotover. 23.vii. G.D.H.C. and G. Talbot . . . . .	19	10
5. Herts, Harpenden. 19.vii. C. B. Williams . . . . .	15	39
6. Dorset, Swanage. vii-viii. H. H. Bloomer . . . . .	3	12
7. Sussex, Brighton. 14.vii-5.viii. H. Blackiston . . . . .	24	32
TOTALS, July—August . . . . .	545	766
	(=41.6%)	(=58.4%)

In Table III collections 1, 2, 3, 7, are complete; 4, 5, 6 are - random samples.

It will be noticed that in the May samples males predominate and this agrees with the figures (18 ♂♂, 11 ♀♀) given by W. E. Cox for a May collection from Cardiff (1940, *Ent. mon. Mag.*, **76**:161). During July and early August there was a preponderance of females eaten over males, represented by the totals of 545 males and 766 females. Unfortunately, I have no figures available to show what the real proportions in the field were at these times. The somewhat larger, fatter, and slower female would seem to offer better food value for less effort than the male. Another point is worth noting. Mr. Bloomer's observation that no wings of 'coloured' butterflies were found is supported by Lord Bolingbroke's observation recorded by Frohawk (1940, *Entomologist*, **73**:137-8). I do not think that this suggests that *Pieris* is more edible than 'coloured' species, but rather that in the presence of such overwhelming numbers of one species the temporary habit is acquired of utilising this superabundant food. This has a bearing on the concluding paragraph dealing with attacks on migrants. Other correspondents than those mentioned have written from Swindon and Leicester to call attention to the destruction of *brassicæ*, which seems to have been widespread and remarkable.

These records provide an answer to the argument put forward by MacBride in 1932, *Sch. Sci. Rev.*, **13**:201-10, that it is a commonplace that, when shoals of fish enter a bay, birds which prey upon fish are attracted to benefit by the unusual supply, but on the other hand there is little evidence that migrating butterflies attract birds to an equivalent extent. This argument was countered by the present writer in 1936, *Sci. Prog.*, **30**:633-4, when examples were given of the phenomenon which was said not to occur. An observation by Mr. J. K. Hill of Gilgil, Kenya Colony, received more recently, is much to the point. He was fishing on the Malawa river and noticed great numbers of white butterflies (*Glycestha* = *Anapheis*): so many that 'I cannot hazard even a guess at the numbers passing a given point at the height of the flight, which continued for days. Every Bee-eater along the banks was in the air hawking.'

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September 9th, 1940.

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OBSERVATIONS ON THE SOIL OF THE MOUNDS OF THE MINING  
BEE *ANDRENA ARMATA* GMELIN (*FULVA* SCHRANK).

BY W. PICKLES.

In studying the soils of ants' nests, it was found (Pickles, 1940, *Ent. mon. Mag.*, 76:49-52) that the ants made the soil of their mounds more alkaline than the surrounding soil; particularly was this the case with *Lasius flavus* F. As *Andrena armata* is well-known for the small conical mounds of soil which it makes in spring, it was decided to investigate whether or not there was any difference in the pH of this soil and the normal soil round the burrow. The bees make their burrows in considerable numbers within a few square yards area. The colony investigated was among bare patches in meadowland at Ledstone Park, on the Magnesian Limestone belt about ten miles east of Leeds.

The method adopted was the same as that used for the determination of the pH of the soils of the ants' nests (Pickles, *loc. cit.*). Samples of the mound soil and the ordinary soil were taken on the dates given in the table and shaken with twice their volumes of distilled water, previously neutralised to pH7.0. After eighteen hours, the cleared supernatant liquid was decanted off and tested in a Lovibond Comparator, using the standard indicators of W. M. Clark (1928, The determination of hydrogen ions, 3rd ed., Lond.).

TABLE I. pH OF THE SOILS.

Date.		Mound soil.	Ordinary soil.	Cemented 'core.'
2.v.40	.....	7.6	7.3	7.8
16.v.40	.....	7.7	7.6	7.9
21.v.40	.....	7.5	7.4	7.8
30.v.40	.....	7.8	7.7	7.8
6.vi.40	.....	7.5	7.5	7.7
13.vi.40	.....	7.5	7.5	8.1
20.vi.40	.....	7.5	7.5	7.7
27.vi.40	.....	7.6	7.6	7.6
2.vii.40	.....	7.5	7.5	7.5
9.vii.40	.....	7.5	7.5	7.5

From Table I it seems that when the soil is first built up by the bees in making the burrow, it has a more alkaline reaction than the ordinary soil round about it (*i.e.* a pH of 7.6 as against 7.3 for the ordinary soil). As the soil is exposed to the action of the atmosphere, it becomes increasingly acid until it finally registers the same pH reaction as the soil around it. However, there seems to

be a core of cemented soil particles near to the burrow itself. This has a more alkaline reaction than the loose soil which composes the rest of the mound. As the season goes on, this 'core' shows the same pH reaction as the loose soil. The size of this 'core' of cemented particles was on the average about 2.0 cms. high, 1.5 cms. diameter, and the diameter of the burrow through it, about 0.5 cms.

I wish to thank the owner of Ledstone Park, Colonel Wheeler, for permission to use the land; Mr. H. Wright, Principal of the Municipal Technical College, Dewsbury, for the loan of a Lovibond Comparator, and Mr. W. D. Hincks for confirming my determination of the bee.

2 Cypress Villas,  
Wakefield Road,  
Garforth, Leeds.  
July 14th, 1940.

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A NEW BRITISH *TENTHREDO* OF THE *ARCUATA-SCHAEFFERI* COMPLEX, WITH A KEY TO THE EUROPEAN SPECIES (HYM., SYMPHYTA).

BY ROBERT B. BENSON, M.A., F.R.E.S.

Some years ago Dr. R. C. L. Perkins, F.R.S., discovered that in Devonshire there were two species included under '*Tenthredo arcuata* Forster,' differing in colour pattern as well as in habit. When he pointed this out to the late Rev. F. D. Morice, Morice extracted the saws of both forms and, finding differences in them, described a new species—*Allantus perkinsi* Morice, 1919. His paper was illustrated with rather blurred photographs of the saws. Before he died he told me that after the description and photographs had been published he had never been able to confirm these saw differences in further dissected specimens of the two species, all of them having saws identical with his photograph of the saws of *Tenthredo perkinsi* (Morice). He came to the conclusion that he must have accidentally photographed the saws of some entirely different species in mistake for those of the true *T. arcuata* Forster.

In the south of England even without saw differences *T. perkinsi* Morice is easy enough to separate in the female, because the yellow band on the first tergite is not constricted laterally as it is in *T. arcuata* Forster, but in Scotland and Ireland and on the continent of Europe paler forms of *T. arcuata* Forster sometimes approach *T. perkinsi* Morice in this character. The result of this is that *T. perkinsi* Morice has never been accepted on the continent

as a valid species. Actually there is a good morphological character, not previously recorded, in the shape of the hind margin of the hypopygium (last ventral segment) in the female. On this character females of *T. perkinsi* Morice and *schaefferi* Klug can at once be separated from those of *T. arcuata* Forster (figs 1 and 2).

When I was recently dissecting some freshly caught specimens of *T. perkinsi* Morice and what I thought were *T. arcuata* Forster, I found, to my surprise, that the latter specimens had saws that agreed with those of the unknown species figured as *T. arcuata* Forster by Morice (1919). Thus we apparently have still another species mixed in collections with *T. arcuata* Forster. I have now separated a long series of this new species in the collection at the British Museum. In addition to the saw differences (figs. 3 and 4, 3A and 4A) the new species is less strongly punctured on the temples and behind the eyes than is *T. arcuata* Forster, usually has the first antennal segment entirely black and seems to occur mostly only after midsummer.

All the specimens of '*T. arcuata* Forster' collected from late June to October in Britain proved to belong to this new species or else to *T. perkinsi* Morice, while the April to early June specimens were all of them true *T. arcuata* Forster. A single exception to this was one specimen of *T. arcuata* Forster taken in Cornwall in August; this suggests that *T. arcuata* Forster occasionally has a second brood. Thus as this new species and *T. perkinsi* Morice are on the wing at the same time, it is very natural that Morice should have selected one of the new species for dissection to represent *T. arcuata* Forster when comparing the saws with those of *T. perkinsi* Morice.

Normally *T. arcuata* Forster has the first antennal segment yellow marked below, but specimens from north Britain usually have the first segment entirely black. Not too much stress, therefore, can be placed on this colour character. At the same time it does give a clue to the identity of the original *Tenthredo arcuata* Forster, 1771, which was described (from British material) as having the basal antennal segment marked with yellow — a character that is not common in our new species.

Kriechbaumer in 1869 described from Bavaria a species which he called '*Allantus sulphuripes*' differing from *T. arcuata* Forster in that its front and middle femora were entirely yellow and the hind femur with only a small black spot near the apex. This is apparently a pale-legged form of our new species; this form occurs also in Britain; out of 80 female specimens of our new species

collected near Ivinghoe Beacon, Buckinghamshire, on August 4th, 1940, five have the legs so coloured, six have broken black lines on the front and middle legs, and 69 have all the femora lined with black on the upper inner side. All of these specimens have entirely black antennae, except two of the pale-legged forms, which have the first antennal segment marked with yellow below. In the collection of specimens in the British Museum from Central Europe there are 32 of our new species with the front legs pale or mostly pale and 12 of the dark-legged form, the latter mostly from high up in the Alps. It would appear that the dark-legged form is commoner in the north and in the mountains and the pale-legged form in the south. Of 64 *T. arcuata* Forster and 117 *T. perkinsi* Morice females from various parts of Europe not one is pale legged as in *T. sulphuripes* Kriechbaumer.

*T. sulphuripes* Kriechbaumer, 1869, was regarded by Enslein (1912) as a colour form of *T. arcuata* Forster, but it seems that we can safely apply the name to our new species. *Allantus arcuatus* var. *nitidior* Konow, 1888 (*nec* Enslein, 1912), was characterised as having less strongly punctured temples and a dark first antennal segment, and so presumably represents the dark-legged form of *T. sulphuripes* Kriechbaumer.

Unfortunately no characters have yet been found for separating the males satisfactorily. The genitalia of males taken in copulation with females of all the four British species have, so far, revealed no reliable distinguishing characters. In examining the female hypopygium many specimens can be found with small portions of the hypopygium torn away each side. The tearing away probably takes place during copulation.

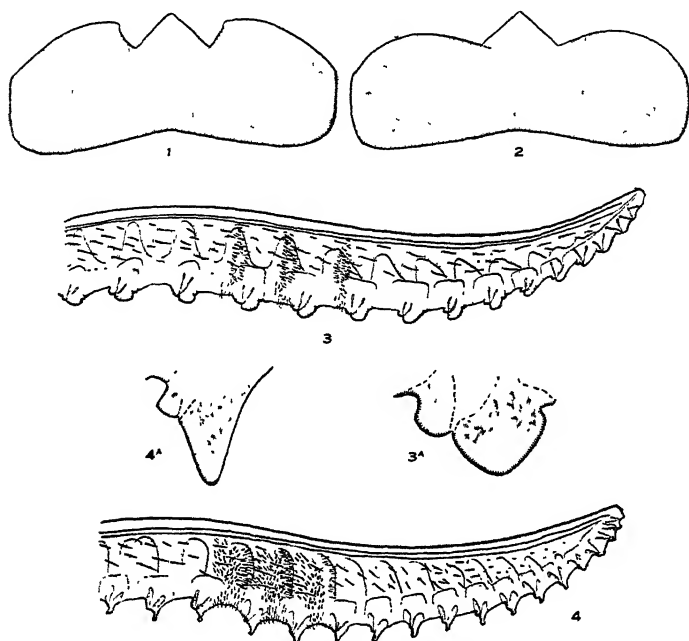
As to the larvae of the sawflies of this group, that described by Carpentier (1907) on *Bupleurum falcatum* L. belonged, according to this author, to *T. sulphuripes* Kriechbaumer, while that described by R. v Stein (1883) on *Lotus corniculatus* L. as *Allantus arcuatus* Forster may belong to *T. sulphuripes* var. *nitidior* Konow, *T. perkinsi* Morice or to *T. arcuata* Forster. I have not been able to find in his collection, which is now in the British Museum, any of the specimens bred by Stein. It would appear, therefore, that the larvae of *T. arcuata* Forster and *T. perkinsi* Morice, among the commonest of European sawflies, are not yet known for certain.

The females of the four British species in the *Tenthredo arcuata-schaefferi* complex can be separated in the following key. I have included two other European species which I found in some abundance high up in the mountains at Arolla and Ferpécle, Valais,

Switzerland, in June and July, 1935. *T. aegra* Enslin was regarded by Enslin as simply a dark form of *T. arcuata* Forster, while what I call *T. algoiensis* Enslin he regarded as a geographical race of *T. schaefferi* Klug. All six species were regarded by Enslin in his monograph (1912) as colour forms of two species, *T. arcuata* Forster and *T. schaefferi* Klug, because the morphological differences between them had escaped his notice. Still other European species probably exist. The four British species are marked with an asterisk (\*).

1. Hind tibia and tarsus marked with black; subcosta of fore-wing piceous; wings subhyaline; smaller species, 8-11 mm. [Tegula yellow-marked except in *T. aegra* Enslin.] . . . . . 2.
- Hind tibia and tarsus marked with brown; subcosta of fore-wing brown; wings yellowish; larger species, 10-13 mm. [Tegula entirely black; hypopygium and saw as in *T. perkinsi* Morice, figs. 1, 3 and 3a.] . . . . . 5.
2. Hypopygium as in fig. 1; propodeum usually with a yellow band which is more or less constricted laterally, but it may be almost entirely or entirely black . . . . . 3.
- Hypopygium as in fig. 2; propodeum usually with a broad yellow band that is not constricted laterally. [Saw as in *T. arcuata* Forster (figs. 3 and 3a); throughout Europe; in Britain common from July to October . . . . . \* *perkinsi* Morice.
3. Tegula always marked with yellow, so also usually the pronotum, the mesopleura and often the basal antennal segment; malar space much shorter than the apical breadth of the 2nd antennal segment. British . . . . . 4.
- Tegula, antenna, and often pronotum and mesopleura entirely black; malar space about as long as the apical breadth of the 2nd antennal segment. [Saw as in *T. arcuata* Forster, figs. 3 and 3a. Arctic regions and mountains of Central Europe.] . . . . .  
*aegra* Enslin, 1912 (= *brevicornis* Konow, 1886, *nec* Klug, 1814.)
4. Saw as in figs. 3 and 3a; head behind the eyes dull with fine dense surface sculpture. All femora lined with black and in the south of England the basal antennal segment is usually yellow marked below. Common throughout Europe; in Britain from April to the end of June, occasionally in August (? second brood) . . . . . \* *arcuata* Forster.
- Saw as in figs. 4 and 4a; head behind the eyes usually shining and but sparsely punctured. In the type form of this species the femora of the front and middle legs are all yellow and the hind legs have only an inner apical black spot. The antenna also has a yellow marked first segment. Generally, however, the antenna is entirely black and the femora of all legs are lined with black on the upper edge (var. *nitidior* Konow). In Scotland specimens often have the first tergite entirely black. Common throughout Europe; in Britain from the middle of June till October . . . . .  
\* *sulphuripes* Kriechbaumer.
5. Scutellum and 1st antennal segment yellow-marked; malar space much shorter than the apical breadth of the 2nd antennal segment. [Central and southern Europe. In Britain so far only recorded from the southern counties of Devon and Sussex. July and August.] . . . . . \* *schaefferi* Klug.

- Scutellum and 1st antennal segment entirely black; malar space longer than apical breadth of the 2nd antennal segment. [Mountains of Central Europe (Switzerland and Algäu).] ..... *algotiensis* Enslin, new status (= *T. schaefferi* var. *algotiensis* Enslin, 1912).



FIGS. 1-4.—1, hypopygium of *Tenthredo arcuata* Forster, ♀; 2, hypopygium of *T. perkinsi* (Morice), ♀; 3, saw of *T. arcuata* Forster; 3a, enlarged middle tooth of the same; 4, saw of *T. sulphuripes* Kriechbaumer (Scotch race); 4a, enlarged middle tooth of the same.

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August 16th, 1940.

*Crioceris lilii* Scop. (Col., Chrysomelidae), in Chobham, Surrey.—A friend of mine, in this village, found this beetle in numbers on his lilies (*Lilium regale* E. H. Wils. and *L. tigrinum* Kar. Gawl.) and sent specimens—as a pest—to Wisley, where they were identified by Mr. G. Fox Wilson. My friend then rang me up and asked if I would like some, and said he had kept two for me. These I fetched next day (mid-August), and was fortunate in finding three more feeding on *Lilium tigrinum*. My friend tells me that he noticed the beetle last year feeding on fritillaries, and later upon his lilies. The same happened this year. They certainly proved a pest, as the foliage was marked all over with their attacks. This beetle, in life, looks very beautiful, its scarlet colour showing up brilliantly against the foliage. Unfortunately all but a few of these lilies have been cut down and burnt, so that I fear I cannot count on finding any more specimens, but next year, with any luck, I hope to take a good number. I shall be glad to know if other collectors have taken this beetle in recent years.—LEWIS F. BARTON, Pepperstitch, Bagshot Road, Chobham, Surrey: September 12th, 1940.

*Cryptusa capitalis* Mulsant and Rey (Col., Staphylinidae) in Worcestershire.—This beetle, introduced to the British List by Mr. A. A. Allen (1940, *Ent. mon. Mag.*, 76:80-1) was found in some numbers from September to November, 1939, at Hartlebury, Worcestershire. The material in which it was discovered was a big heap of mixed oak and elm sawdust, and the insect was generally present at the points where fermentation was going on, and the sawdust below the surface was warm. The beetle was very sparingly present, a bag of two or three pounds of sawdust rarely produced more than two or three specimens. In all fifteen or sixteen specimens of the beetle were obtained, a number of which were immature. I was unable to place the species, but on reading Mr. Allen's description of *Cryptusa capitalis* I sent him a specimen; he was at first rather doubtful, but on seeing further specimens confirmed the Worcestershire beetles as identical with his *Cryptusa capitalis*. Among other beetles found in the sawdust were *Medon obsoletus* Nord. and a small colony of *Alphitophagus quadripustulatus* Steph.—G. H. ASHE, Gribblemead, Colyton, S. Devon: September 1st, 1940.

*Protest against the 'Planting-out' of Natural Objects.*—Can anything be done to discourage the 'planting-out' of natural objects? Just now there is, I believe, a great deal of it being done, particularly of wild-flowers and of lepidoptera. Usually advocated as helping Dame Nature to beautify herself—painting the lily, so to speak—it has become a snag in the collection of accurate data as to distribution. It cannot, also, fail to bring uncertainty into local variation, and into the natural spread of species previously local in character. Even notes on such migrating species as *Vanessa atalanta* L. lose interest if the species has been intentionally liberated. As an example of the evils of that doubtfulness as to records which the practice raises I may instance the following. Two friends of mine have undertaken the laborious work of revising and bringing up to date the lists of insects for the Isle of Man. One recently wrote to me that he had received a record of ten species of the so-called 'macro-lepidoptera,' new to the list, and taken in the last four years. Several of these ten seem to me for various reasons to be doubtful, though there is no reason to doubt the captor's *bona fides*. One, *Procris geryon* Hb., feeds in the wild state only on species of Cistaceae, which family does not occur in the Island outside gardens. I do not think that the insect could have come over in garden plants. *Mimas tiliae* L. is a southern species unlikely to be really native.

*Angerona prunaria* L. and *Lymantria monacha* L. are also mainly southern, and unlikely to have been overlooked in this well-worked Island. There are several others in the ten additions. I do not say that these *cannot* be native, but the 'planting-out' habit raises reasonable doubt. I do not think that anyone who knows the additional trouble that the practice causes would willingly add to the perplexities of those engaged in serious work.—CYRIL I. PATON, 'Ormley,' 7 Cavendish Road, Sutton, Surrey: September 14th, 1940.

*Lype reducia* Hagen (Trich., Psychomyiidae) in Herefordshire.—This species would probably be found to be not infrequent if more trouble were taken to separate it from the abundant *Lype phaeopa* Steph. A specimen taken by my son, A. D. Grensted, at Bromyard on August 15th of this year adds another county to its known range.—L. W. GRENSTED, Oriel College, Oxford: September 14th, 1940.

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### Society.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY: August 8th, 1940.—The President in the chair. Dr. E. A. Cockayne exhibited a larva of *Smecrinthus* hybr. *hybridus* Steph. Mr. S. Wakely, *Spilosoma lutea* Hufn. ab. *fasciata* Tgw1. from Clapton. Mr. T. R. Eagles, bred examples of the Tortrix *Evelina huoliana* Schiff. and ova of the Neuropteran *Chrysopa flava* Scop. Mr. F. D. Coote, a larva of *Nemotois fasciella* F., Ashted, Surrey, 7.viii.40, and, on behalf of Mr. H. J. Turner, species of the Catagrammids group of South American Nymphalids, *Perisama oppelii* Latr. and *P. bonplandii* Guér. Dr. K. G. Blair, a selection of galled twigs of willow together with some of the insects and their parasites reared from them. Mr. Attwood, ants taken from a swarm at Sydenham, 31.vii.40, with notes on the occurrence. Reports of several Field Meetings were presented and read.—H. J. TURNER.

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### Reviews.

'STATISTICAL METHODS FOR MEDICAL AND BIOLOGICAL STUDENTS.' By GUNNAR DÄHLBERG, M.D., LL.D. Demy 8vo, 232 pp. London (George Allen and Unwin, Ltd.). 1940. Price 10 6.

Books on statistics tend to be either so technical that they are beyond the comprehension of the average biologist endeavouring to make the best of an inadequate training in mathematics, or to be so elementary that they utterly fail to satisfy his needs. This work takes the happy middle path and may be read with advantage by anyone who can digest that 'light, crisp biscuit,' Newton's Binomial Theorem, and say with J. H. Fabre (1913, *The Life of the Fly*: 299-300), 'What a delightful afternoon that was, before my grate, amid my permutations and combinations!' Although written primarily for medical students, the methods discussed are of universal application and should be of particular value to entomologists who frequently desire to compare measurements or other biological data and to assess the significance of their observations.

'SOME RECENT CONTRIBUTIONS BY ENGLISH WORKERS TO THE DEVELOPMENT OF METHODS OF INSECT CONTROL.' By C. T. GIMMINGHAM, B.Sc., F.I.C. *Ann. Appl. Biol.*, 27:161-175. 1940.

In this Presidential Address the economic worker will find an excellent summary of recent control methods, chiefly developed in Britain and applicable to the special needs of this country. It includes a long and useful list of references.



'SAWFLIES OF THE BERKHAMSTED DISTRICT, with a list of the Sawflies of Hertfordshire and Buckinghamshire, and a survey of the British Species (Hymenoptera Symphyta).' By ROBERT B. BENSON, M.A., F.R.E.S. *Trans. Hertf. Nat. Hist. Soc.*, 21 (3): 177-231. 1940. Price 5 s.

The main object of this survey is 'to present as full a picture as possible of a local Sawfly fauna; and to demonstrate the possible richness to be discovered by one person working persistently in a limited region.' This object is admirably achieved, as 313 of the 436 British species (=72%) are recorded for the two counties concerned. Over a hundred years ago J. F. Stephens listed 32 species from Hertford, the occurrence in the county of all but five of which has been confirmed by recent captures. *Istaitis troglodyta* F., however, has not been found in Britain since Stephens' time, although a correctly named specimen of it is preserved in his collection at the British Museum (Nat. Hist.). The Turnip Sawfly, *Athalia rosae* L., was formerly a serious pest, but is now much reduced in numbers owing to the practice of crop rotation. *Pontania purpureae* Cameron, described over 50 years ago from a single bred specimen, remained undetected again until 1936, since when it has been found in Hertfordshire and in many widely separated counties. The author devotes some four pages to consideration of the chief ecological habitats encountered in the Berkhamsted District, but considers that it is premature to discuss the British Sawflies zoogeographically, although he points out that there is a group of arctic-alpine species on the tops of our northern mountains, a small endemic element and some thirty alien species which have become established here. The annotated list of species gives useful information about times of occurrence and food plants, and mentions by name all British species found outside the area under consideration, although their systematic position is not indicated. A noteworthy list of references completes the work.

*POCOTA PERSONATA* (HARRIS, 1776) (= *APIFORMIS* (SCHRANK, 1781))  
(DIPT., SYRPHIDAE): OCCURRENCES IN BRITAIN.

BY B. M. HOBBY, M.A., D.PHIL., F.R.E.S.

*Musca personatus* was described and figured in colour by Moses Harris (1776, *Exp. Eng. Ins.*: 79, pl. 24, fig. 20) from a specimen taken in August on the inside of a window in an empty room at Stepney, Middlesex. In bringing forward the name *Plocota* [err. pro *Pocota* apud Schiner, 1862, *Faun. Austr.*: 351] *apiformis* Schrank (= *Musca apiformis* Schrank, 1781, *Enum. Ins. Austr.*: 459) Verrall (1871, *Ent. mon. Mag.*, 7:203) stated that 'this species and genus can hardly be considered new to our lists, considering it is figured by Moses Harris from a British specimen; it has, however, never been recorded since. Mr. J. C. Dale possesses a specimen.' In 1901 (*Brit. Flies*, 8:589) he was 'more inclined to consider that Harris' description and figure apply to *Arctophila bombiformis*, which, however, is not present in our British lists.' On a later page (p. 633) he states that he possesses several Con-

tinental specimens of *A. bombiformis* 'and I cannot help thinking that the *Musca personatus* of Moses Harris represents this species . . . *A. bombiformis* is a large *Bombus*-like fly covered with dense pubescence, which is whitish on the front of the thorax, then black behind, but yellowish on the scutellum.' C. W. Dale (1902, *Ent. mon. Mag.*, **38**:108) asked, 'Is not *Pocota personatus* Harris an older name for *P. apiformis* Schrk.?' to which Verrall replied (p. 109), 'See British Flies (*Syrphidae*), pp. 589 and 633. I only reinstate Moses Harris' names when they are indisputable; in this case there is doubt which can never be cleared up.'

On comparing Verrall's description of *A. bombiformis* with Harris' coloured illustration of *M. personatus*, two differences are apparent: *personatus* has the front of the thorax yellow not whitish, while the scutellum is black not yellowish. Mr. R. L. Coe has very kindly examined the long series of Continental *bombiformis* in the British Museum (Nat. Hist.) and informs me that they have the front of the thorax with yellowish pubescence (not whitish as stated by Verrall), and in this respect they agree with Harris' figure. The scutellum, however, is yellow-haired, as also is the disc of the second abdominal tergite. This difference, coupled with the fact that *A. bombiformis* is still unrecorded from Britain, strongly suggests that *personatus* and *bombiformis* are not the same species.

Verrall gave no reason for abandoning the view that *personatus* and *apiformis* were identical; it is desirable, therefore, to consider this possibility once more. Firstly it should be noted that Verrall described the coloured bands of *apiformis* as reddish-orange or tawny; the former description applies to two males of the five specimens preserved at Oxford, the latter to another male and to two females. As pointed out above, in Harris' figure these bands are yellow and probably this difference in colour largely influenced Verrall to change his mind. Sack (in Lindner, 1932, *Fliegen Palaeark. Reg.*, *Syrphidae*: 358) describes these hairs in *apiformis* as 'rotgelber oder messinggelber,' presumably basing his account upon Continental specimens. Adams (1901, *Ent. mon. Mag.*, **37**:199) took two female *apiformis* which he stated had 'the bands on both thorax and abdomen . . . pale golden-yellow instead of "tawny or reddish-orange."' These specimens have been re-examined in the British Museum (Nat. Hist.) by Mr. Coe, who states (*in litt.*) that he 'cannot differentiate between golden-yellow and orange; either description would be apt for these examples, although "pale golden-yellow" would not apply.' Recently, how-

ever, Mr. A. M. Critchley-Low has taken a female *apiformis* which he describes (in press) as having light lemon-yellow bands, a statement which he has very kindly confirmed in a letter, while two males and two females bred in March this year by Mr. A. A. Allen were undersized and had the 'usually tawny pubescence yellow.' This difference may have been due to immaturity, but Donisthorpe's bred specimens have the pubescence tawny and no doubt mature individuals are variable as regards the colour of the light bands.

I suggest, therefore, that *personatus* Harris is a yellow-banded form of the species usually known as *apiformis* Schrank, who described it as having 'fascia in basi thoracis, & alia per medium abdominis flavae.' Indeed, most of the details given by Harris seem to fit such a hypothesis, e.g. black head, thoracic hair thicker than abdominal hair through which the glossy abdomen may be seen, white anal parts [some specimens have these tawny], long black legs [knees and tarsi are obscurely reddish], sector-edge of wings tinged with amber and a brown cloud proceeding from this edge irregularly half-way across the wing. Moreover, Harris states that when at rest the wings of *personatus* lie on the back, neatly covering each other, a fact which has been noticed in *apiformis* by Edwards (1926, *Entomologist*, 59:267). This resemblance in the manner in which the wings are carried was first pointed out to me by Mr. Coe; it is, as Mr. Collin reminds me, 'by no means peculiar to *Pocota*, but one commonly adopted by many Syrphidae and other families of Diptera.' It should also be noted that the specimen of *personatus* was unique and that it was found in a window. This has its parallel in the rarity of *apiformis* and in the capture of two specimens in windows, another under a glass coping, a fourth dead in a lamp-shade and a fifth in a spider's web; i.e. a considerable proportion of the 24 adults known to have been taken in England were secured in or around buildings of various kinds. *P. apiformis* breeds in decaying wood and is no doubt accustomed to enter holes in trees where the intensity of light is less than in the open. This habit would be sufficient to account for the entry of the insect into houses, etc., and in the light of this consideration Harris' discovery of *personatus* on the inside of a window becomes specially significant.

Finally, it may be added that additional points of resemblance may be seen in the figure, e.g. the small head (narrower than thorax), wing venation (cubital vein without Eristaline dip) and hairy femora. The illustration of the head indicates some of the

characters seen in lateral view and brings out the broken base of an antenna, concave face, prominent mouth projection and large labellum; it is decisively different from the figure of *Arctophila bombiformis* Fall. given by Lundbeck (1916, *Dipt. Danica*, 5: 558, fig. 186).

There remain two difficulties, viz. size and date. Harris states that *personatus* measures eleven lines, i.e. 23 mm.; in the English description he gives no indication how this measurement was made, but in the French translation he gives the measurement as 'onze lignes, les ailes déployées.' The illustration is of a fly having a total wing expanse of seventeen lines, while head, thorax and abdomen together measure eight lines. If the wings be imagined in the overlapping resting position, then the total length from the head to the apex of the wings would be only  $9\frac{1}{2}$  lines. The first two measurements do not agree with that given by Harris, the last is nearer, but is inconsistent with the French statement that the wings are spread out. Actually the overall length of the figure inclusive of legs in the position in which they are depicted, is approximately eleven lines. This measurement is valueless, for it is dependent upon the degree of extension of the legs, but it appears to have been used for several other figures on the same plate which present similar difficulties in interpretation. In passing it may be noted that the Harris inch illustrated on page ii of the Preface to the 'Exposition' in the copy of the 1782 edition preserved in the Radcliffe Science Library at Oxford is a little short, being only .9895 of a standard inch. This difference may be due to an error in the scale depicted or to subsequent shrinkage of paper, but the amount is so small that it may be safely ignored.

Verrall gives the length of *P. apiformis* as 13 mm., Sack as 12-13 mm., the five specimens in the Hope Department, measured from the head to the apex of abdomen, range from 14 and 16 mm. Harris' figure, similarly measured, covers 17 mm.; this is admittedly slightly more than any yet recorded for *apiformis*, but the species is so rare in collections that it cannot be claimed that the range in size is firmly established.

As regards times of occurrence, Harris gave August for *personatus*, while living specimens of *apiformis* have been taken in the field only between 9th May and 24th June, although others have been bred in March and April. The dates are, however, based upon very few records, about twenty, and as the species has been found on the Continent from May to August (*sec.* Sack), a somewhat similar range in time of flight may well be expected in Britain, the

time no doubt depending upon the degree of dryness or wetness of the season.

A list of all records known to me of the occurrence of *Pocota* in Britain is given below; the details in square brackets give information additional to that previously published and also indicate by initials the collection in which the material is preserved.

One worn ♂ [J.E.C.], Suffolk, Newmarket, on window, 9.vi.40, J. E. Collin. Larvae, 2 ♂♂, 2 ♀♀ bred, iii.40 [A.A.A.], Berks, Windsor Forest ['From larvae taken at the end of June, 1939, two males and two females emerged the following March. The larvae occurred deep down in wet wood mould in the hollow trunk of a beech tree, and appeared about two-thirds grown. In May, 1940, larvae of *Myiatriopa florea* L. were abundant in this tree (the flies emerged the following month) and among them was one small *Pocota* larva. A fortnight ago a search of the tree yielded three quite large larvae of *Pocota* (but none of *Myiatriopa*). These larvae all occurred at or near the bottom of the cavity where the mould is wettest and semi-putrid. I have also found the empty puparia in some numbers under similar conditions in the roots of an old elm tree in the same locality.'—A. A. Allen (*in litt.*, 30.vii.40)]. 1 ♀ [A.M.C.-L.], Surrey, East Sheen, Palewell Common, 20.v.39, A. M. Critchley-Low (1940, *J. Soc. Brit. Ent.*, 2 (in press)) [Mr. Low informs me that Palewell Common is adjacent to Richmond Park and is overgrown with hawthorn, birch and gorse with fairly dense undergrowth and small clearings. The specimen was taken during the morning in one of the clearings, where it settled on a damp patch after flying low over the ground. The flight was rapid and fussy and unlike that of *Merodon equestris* F. for which it was at first mistaken]. Numerous larvae [1 larva, H.D.], Oxford, Headington Hill, 7.i.37, H. Probbits ['The larvae were collected in a heart-rot pocket of a large elm. The wood was thoroughly rotted and extremely wet.'—D. E. Parker (*in litt.*, 18.vii.40)]. Two larvae, one pupa, one adult reared, 18.iii.36 [Zool. Mus., Cambridge], Cambridge ['An old elm in King's College Fellows' Garden fell in January, 1936. About 30 feet from the ground there was a cavity containing very wet rotten wood in which there were very many (at least 200 or 300) Syrphid larvae. Most of these larvae had long 'tails' and eventually gave adults of *Myiatriopa florea* L. and *Mallota cimbiciformis* Fall. There were, however, four larvae among those collected which had quite short 'tails.' One of these was immediately preserved in spirit; the other three were kept in a separate breeding jar. Two of the three died of mould; one as a larva, the other as a pupa. Both of these were preserved in spirit. The remaining individual emerged as an adult on 18th March, 1936.'—G. Salt (*in litt.*, 25.vi.40)]. One ♀ [H.D.], Oxford, dead in electric light shade, 24.x.30, E. B. Poulton (1931, *Proc. ent. Soc. Lond.*, 5 (3): 98). Five ex. (one ♀, B.M.; one ♂, H.D.), Berks., Windsor Forest, larvae found 8.ii.28 some 50 feet from ground in a damp and decayed part of an ash, adults emerged 5-19.iv.28, H. Donisthorpe (1928, *Entomologist*, 61:150-1; 1928, *Proc. Ent. Soc. Lond.*, 3:36). One ♀ [J.W.S.], Hunts., Warboys, in lane near a wood, on blackthorn, 16.v.27, J. W. Saunt (E. B. Poulton, 1932, *Proc. Ent. Soc. Lond.*, 6 (3): 93). One ex. [♂, B.M.], Herts., Letchworth, in garden, 9.v.26, F. W. Edwards (1926, *Entomologist*, 59:267). Two ♂♂, Notts., Gedling Wood, 31.v. and 7.vi.21.—D. Hunter (J. W. Carr, 1935, *Invert. Faun. Notts., Suppl.*: 112). One ex. [♂, W.J.A.], Berks., Wellington College, in window, vi.18,

W. J. Arkell (1919, *Entomologist*, 52:261). ? no., Shropshire, Longner Hall, 18.vi.15, R. F. L. Burton (H. Bury, 1920, *Ent. mon. Mag.*, 56:253). [One ♂, B.M. (on deposit)], Somerset Woods, Weston-super-Mare, 23.v.16 (M. and R. Jermyn, H. J. Charbonnier, 1917, *Proc. Som. Arch. Nat. Hist. Soc.*, 57:169). One ♀ [H.D.], Oxford, University Museum, in spider's web, 3.vi.13, A. H. Hamm. ? no. [one ♀, B.M.], Shropshire, Longner Hall, 18.v.12, R. F. L. Burton (H. Bury, 1920, *Ent. mon. Mag.*, 56:253). One ex. [♀, P. Harwood], Essex, Colchester, High Woods, 'flying round a birch tree,' 9.v.05, B. S. Harwood (1905, *Ent. mon. Mag.*, 41:262). Two ♀♀ [B.M.], Hants., New Forest, 'one basking in the sun on a leaf of sweet chestnut,' 21.v.01, 'another under the glass coping in my garden,' 29.v.01 [the published record gives the date 25.v.01, but Mr. Coe informs me that the specimen bears the label 29.v.01 and is in agreement with Adams' diary], F. C. Adams (1901, *Ent. mon. Mag.*, 37:199). One ex., Suffolk, Bury St. Edmund's, Tostock, bred from nest of *Bombus*, W. H. Tuck (E. W. Bloomfield, 1898, *Ent. mon. Mag.*, 34:137) [Verrall believed that there was an error in this record as the larva lives in decayed wood; a note by the late Major E. E. Austen in the British Museum states that he saw the actual specimen and verified the determination]. One ♂, Worcestershire, Wyre Forest, on hawthorn bloom, 24.vi.94, R. C. Bradley (1895, *Ent. mon. Mag.*, 31:51). Three ex. [two ♂♂, B.M.], Hants., New Forest, Lyndhurst, on blackthorn and hawthorn, 3.v.94, J. W. Yerbury, 'also taken there by Mr. Chawner' [? no.], one ex. in Verrall collection from Wilson Saunders collection labelled 'Kirby,' and one ♀ in Dr. P. B. Mason's collection (Verrall, 1901, *Brit. Flies*, 8:588; Poulton, 1931, *Proc. Ent. Soc. Lond.*, 5 (3):98) [Verrall refers to a specimen in the Dale collection on which he introduced *P. apiformis* to the British list in 1871 and also to 'a record of its having occurred in Leigh Wood, Bristol, in 1841 and 1843, but at present I do not know whence I obtained that record.' Actually there are two specimens in the Dale collection, one with the label Bristol, the other only the number 13 (*cf.* Poulton, *loc. cit.*). Reference to J. C. Dale's interleaved copy of Stephens' *Catalogue of British Insects*, now preserved in the Hope Library, gives the data for these two specimens as, near Bristol, Glost. W. Walcott and H. House. C. W. Dale's MS. catalogue of the collection, also in the Hope Library, puts Leigh Wood, 1841, against W. Walcott's record and Bristol, 1842, against that of H. House, but it is probable that the locality is intended to read Leigh Wood, Bristol, in each case. The figure 'two' as written by C. W. Dale in the date 1842 could easily be misread as a 'three,' and no doubt it was C. W. Dale who had supplied Verrall with the information included in his book].

The above records show that at least thirty-five adult *Pocota* have been bred or taken in Britain during the past hundred years and that the species is widely distributed in southern and midland counties, having occurred in at least fourteen of them.

Breeding from larvae found in very wet rotting wood is the only method by which it has been secured in numbers, the degree of wetness of the wood apparently being much more important than the kind of timber, as larvae are recorded above from ash, elm, and beech, but always in a wet pabulum. Additional breeding records are as follows: Schrank (*loc. cit.*) bred an imago on 3rd May from a 'pupa in carie arborum emortuarum,' Becker (1882,

Wien. Ent. Z., 1:249-50) found larvae and pupae in March in a hollow poplar, from these males and females emerged in early April; Bigot (*sec. Verrall, op. cit.*: 589) had in his collection two females bred on March 27th from pupae found at the foot of a poplar; Kleine (1907, *Ent. Z.*, 21:191), according to Lundbeck (1916, *Dipt. Danica*, 5:499), mentions larvae found in decaying wood of a fungus-infested *Populus pyramidalis* and suggested that the larvae fed on mycelia; the larvae pupated in the decaying wood, and adults emerged between 9th and 23rd May; Lundbeck also mentions a larva found beneath the bark of a beech on 1st April. Dr. C. G. Lamb suggested to me (*in litt.*, 25.vi.40) that the species probably prefers an elevated hole so that there would be very little chance of seeing it from the ground, yet this cannot always be so as is evident from Mr. Allen's experience in finding puparia in the roots of an old elm and the specimens in the Bigot collection bred from the foot of a poplar. Dr. Lamb also suggests that *Pocota* is one of a number of 'cloistered' species which carry on from brood to brood, and only fly to seek a new home when the old one becomes unsuitable to their requirements. In view of the very wide distribution of the insect and the abundance of larvae in suitable holes I regard this as a very likely explanation of its rarity in collections.

I wish to express my thanks to the numerous entomologists who have so generously supplied information concerning *Pocota*, and especially to Miss E. F. Chawner, Rev. Prof. L. W. Grensted, Drs. W. J. Arkell, F. W. Edwards, W. J. Fordham, C. G. Lamb and G. Salt, Messrs. A. A. Allen, H. Audcent, R. L. Coe, J. E. Collin, P. Harwood, A. M. Critchley-Low, D. E. Parker and J. W. Saunt.

Hope Department of Entomology,  
Oxford University Museum.

August 27th, 1940.

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*Exallonyx niger* Panz. (Hym., Proctotrupinae) in Dumfriesshire.—I swept a female of this insect in a rough lane near Gretna on 15.viii.39 and another in the same place on 27.viii.40. G. E. J. Nixon (1938, *Trans. R. ent. Soc. Lond.*, 87:437) says it is fairly common, but from several hundreds of *Exallonyx* examined, these are the only two examples of this species I have found. The straight sided ovipositor distinguishes it at once. Mr. Nixon kindly verified the determination of my earlier specimen. It is an addition to my list in 1939, *Ent. mon. Mag.*, 75:163.—JAS. MURRAY, 6 Burnside Road, Gretna, Dumfriesshire: October 12th, 1940.

# MORE RECORDS OF GALL-MAKING HYMENOPTERA IN THE INNER AND OUTER HEBRIDES.

BY PROF. J. W. HESLOP HARRISON, D.SC., F.R.S.

Early this year, when I published my second paper (1940, *Ent. mon. Mag.*, **76**: 33-34) dealing with Hebridean Gall-making Hymenoptera, I little thought that I should be able to add to it so soon. However, in spite of present conditions, no fewer than three expeditions have been dispatched from King's College to the Western Islands, and these have materially increased our knowledge of the flora and fauna of the area in question. It is proposed to set out some of our new observations here.

## CYNIPIDAE.

*Rhodites eglanteriae* Htg.—Although several rose forms came under examination on the Isle of Benbecula, none carried any Cynipid galls. However, my younger son was fortunate enough to detect the present species on *Rosa Sherardi* Davies var. *submollis* Ley on Colonsay, where it was scarce.

*R. spinosissimae* Gir.—Until this season I had always considered the present form rare except on Canna. In spite of this, I can record its galls as occurring in myriads on *Rosa pimpinellifolia* L. growing on rock-ledges between Gallanach and Cornaig on Coll. Nearer Sorisdale and Bousd, it was only a little less abundant. Clearly, this species fluctuates violently in quantity from season to season.

*Nestophanes brevitaris* Thoms.—This was found rarely on *Potentilla erecta* Hampe amongst rocks on Rueval on the Isle of Benbecula at a height of about 375 feet.

## CHALCIDIDAE.

*Isosoma graminicola* Gir.—At various points on the western coast of Benbecula on *Agropyron junceum* Beauv. on the sand dunes; quite rare.

## TENTHREDINIDAE.

*Pontania pedunculi* Htg.—Common enough on *Salix aurita* L. on Benbecula and Colonsay.

*P. collectanea* Forst.—Not at all rare on Colonsay, but only of local occurrence on Benbecula.

*P. proxima* Lep.—The doubts I have expressed in this magazine (1939, *Ent. mon. Mag.*, **75**:63), and elsewhere, concerning the specific identity of the Pontanias responsible for the 'bean' galls on Salices of the Capreae and Fragiles groups have been abundantly justified. Benson has shown (1940, *Ent. mon. Mag.*, **76**:



88-94) that the species attached to *Salix Caprea* L. and its allies is *Pontania bridgmanii* Cameron, whilst that galling the *Fragiles* is *P. proxima*. These facts involve a revision of my former records, so that true *P. proxima* can now only be reported from Eigg, Coll, Raasay and S. Uist. Of these, the two middle localities are new records. In all cases the plant concerned was *Salix fragilis* L.

*P. bridgmanii* Cameron.—Taken on Raasay, Scalpay, Rhum, Eigg, South Uist and Benbecula and practically always from *Salix aurita* L. On Benbecula, in many areas it is by far the commonest *Pontania*.

*P. puella* L.—On leaves of *Salix aurita* L. and occasionally on those of *S. atrocinerea* Brot., on the Isle of Benbecula.

King's College (University of Durham),

Newcastle upon Tyne, 2.

September 30th, 1940.

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*The Foodplants and Distribution of Cerura vinula* L. (Lep., Notodontidae) in the Hebrides.—Up to the present we have captured this insect on Sandray, Barra, S. Uist, Benbecula, N. Uist and Lewis in the Outer Isles, and on Raasay, South Rona, Scalpay, Longay, Fladday, Pabbay, Eigg, Rhum, Soay and Coll in the Inner Group. Generally, on open moorlands in the whole of these islands, it feeds upon *Salix aurita* L., but on Sandray it chooses the same plant even on cliff ledges in the centre of the Island. On Barra and S. Uist it seemed more abundant on *Populus tremula* L. in gorges and on cliffs, whilst on Benbecula it favoured *S. aurita* and *S. atrocinerea* Brot., none being found on even well-grown sheltered aspens. In addition, on South Uist, in the transition zones near the dunes and the machair, larvae were not uncommon on *Salix repens*. On Lewis and N. Uist, all were found on *S. aurita*. On Raasay, South Rona and Fladday the choice of plant depended on the habitat, amongst rocks *Populus tremula* being preferred and in the open *S. aurita*. In the Isles of Scalpay and Longay aspen very often strays in more open situations, and there *Salix aurita* is neglected. On Raasay, very occasionally, *Salix Caprea* L. is chosen, whilst on Coll, Eigg, Rhum and Soay the position much resembles that on Barra, i.e. the insect prefers *Populus* where that is available, but takes *S. aurita* in stations where aspen fails.—J. W. HESLOP HARRISON, King's College, Newcastle upon Tyne: October 2nd, 1940.

*Bombus muscorum* (L.) var. *pallidus* Evans and *B. smithianus* White (Hym.) in the Hebrides.—We have already indicated on several occasions the extensive and almost universal occurrence of *Bombus smithianus* in the Outer Hebrides, as well as its more limited range in the Inner series. This season we are able to report it from two additional isles, one, Gunna, lying between Coll and Tiree in the Hebrides, and the other Benbecula in the Outer Isles. In both it was quite abundant and early. Our work has mainly been connected with investigations on the flora of the area, and the unexpected detection of certain elements in that of Colonsay, indicated that quite possibly, contrary to our deductions from other data, that island would produce *B. smithianus*. An extensive search was therefore made for it. This was quite fruitless for, as we had originally predicted, *B. muscorum* var. *pallidus* replaced it.—J. W. HESLOP HARRISON, King's College, Newcastle upon Tyne: October 2nd, 1940.

SOME NEW FORMS OF THE GENUS *EUPLOEA* FABR.  
(LEP., DANAIDAE).

BY G. TALBOT, F.R.E.S.

The forms described herein were distinguished whilst I was arranging the specimens of *Euploea* in the Hope Department of Entomology, Oxford. A number of other interesting forms from the Hope Collection have been set aside for later study.

***Euploea distantii wheeleri* ssp.n.**

♂. Upperside more golden-brown than in allied forms. Forewing subapical spots narrower than in *d. distantii* Moore, those in areas 5 and 6 tending to be diffuse on inner edge; submarginal spots in areas 2, 3, and 4 smaller than in *circuita* Swinhoe, being equal to or little larger than the antemarginal spots.

Underside paler brown than in the two allied forms.

*Hab.*—SIAMESE MALAY STATES: Jalor, Biserat, July, 1901 (N. Annandale and H. C. Robinson), 1 ♂ (type in Hope Dept.); *id.*, Nawngchik, Ban Sai Kau, 25.v.1901, 1 ♂ (Hope Dept.). Also from PERLIS: Kangar, Kolam jungle track, 6th mile, 12.ii.1937 (Dr.L. Richmond Wheeler), 1 ♂; Kolam Road, 10.iv.1938, 1 ♀ (Capt. C. F. Cowan). The latter two specimens are in the collection of Dr. A. S. Corbet.

This form connects *circuita* Swinhoe (1903) (Tong-King and Siam) with *distantii* Moore (1882) from Sumatra. A more distinct subspecies is represented by *graminifera* Moore (1883). The male type, from the Oberthür collection, is in the British Museum, and is labelled 'Malaisie'; no other specimen is known to me. It is highly probable that *graminifera* did not come from Malaya at all; its appearance, compared with that of *circuita* and *wheeleri*, suggests a more isolated habitat. As compared with nominotypical *distantii*, all the spots are similarly clear white. Forewing subapical spots smaller, being reduced distally so that the apical area, above vein 5, is broader; submarginal spots in areas 2 to 4 more rounded; spot in 1*b* prominent, being as large as the adjacent antemarginal spot; antemarginal spots larger than in *d. distantii*. Hindwing spots larger than in most *d. distantii*.

The male figured by Distant (1892, *Rhop. Malay.*, pl. v, fig. 9) is not really separable from nominotypical *distantii* from Sumatra.

***Euploea core distans* ssp.n.**

♂. Upperside with distal areas distinctly pale, markings white. Forewing spots all smaller than in *c. core*, the submarginal ones in areas 1*b*, 2, 3, and 4 minute. Hindwing as in *c. core*.

Underside of forewing with spots as above; also a costal dot, minute cell-dot, and similar spot in area 3; spot in 2 about 2 mm. long. Hindwing as on

upperside; also a cell-dot, and post-discal dots in 2, 3, and 6; ground-colour of both wings paler than in *c. core*.

♀. Upperside similar to the male. Forewing with distal pale area more extended above vein 4, somewhat as in *amymone godartii* Lucas, but without the lilac tinge of that form; submarginal and antemarginal spots small, the posterior three submarginal ones somewhat larger than in the male, and all somewhat dusky; a post-discal small rounded white spot in area 3, and white dot in 2; a small white cell-spot. Hindwing markings as in male but dusky. Underside similar to male, but spots mostly larger.

*Hab.*—NORTHERN BURMA: Younghwa, 7.xi.1902 (H. Wood), 1 ♂ (type, in British Museum). BENGAL: Chittagong, Cox's Bazaar, 20.x.1891 (E. F. S. Tylecote), 1 ♀ (allotype, in Hope Dept., presented by the collector).

This insect bears some resemblance to *amymone* Godt., but is distinguished in the male by the much less excurved inner margin of forewing, and in both sexes by the absence on forewing upper-side of a costal spot. In *core* the costal spot is usually absent in both sexes, especially in the male; in *amymone* this spot is usually present in both sexes. There is no doubt that *core* and *amymone* are closely allied.

#### ***Euploea core penanga* f.n.**

♂. Upperside resembles the nominotypical form, but is paler over the distal area, and all spots are tinged with brown.

Underside of forewing with cell-spot, costal spot, and post-discal spots in areas 2 and 3 almost equal in size and somewhat rounded. Both wings with submarginal and antemarginal spots slightly brownish.

*Hab.*—MALAYA: Penang Hill, 1,200 feet, 8.ii.1898 (ex coll. Brodie), 1 ♂ in Hope Dept.

This is the only record of a *core* form from Malaya; it may possibly be entitled to subspecific rank.

31 York Road,

Woking, Surrey.

October 15th, 1940.

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*Peripsocus subfasciatus* (Ramb.) (*Psocopt.*) under stones.—Whilst searching for such Psocids as *Bertkauia* in an old heap of flints, near Addington (Surrey), 22.ix.40, I was surprised to find about two dozen examples of *Peripsocus subfasciatus* (Ramb.). This species usually occurs on trees and shrubs, and its presence in this rather unusual habitat does not seem to have been previously recorded. The flints were heaped under a small elder bush, whose branches were smothered with *Pleurococcus*, and the flints beneath were also green with alga. The Psocids only occurred immediately beneath the bush and at first I suspected that the specimens had dropped off the bush, but beating produced no examples of the *Peripsocus*, only *Eliipsocus* spp. and an *Amphigerontia*. Of the twenty-three *Peripsocus* taken, all but one were females.—D. E. KIMMINS, Dept. of Entomology, British Museum (Nat. Hist.), London, S.W.7: September 28th, 1940.

## NEW SPECIES OF ORIENTAL STAPHYLINIDAE (COL.).

BY MALCOLM CAMERON, M.B., R.N., F.R.E.S.

**Thoracochirus formosae** sp.n.

Fore-parts moderately shining, the abdomen more so; head and thorax black, the former with the clypeus, antennal tubercles and narrow area between them, reddish-yellow; elytra brown, infusate around the scutellum; abdomen black, the last segment reddish. Antennae and legs reddish-yellow. Length 4 mm.

Size of *nanus* Heller and with the antennae similarly constructed, but with narrower head, the eyes less prominent, the punctures fewer and much coarser, thorax more convex, the sculpture coarser, umbilicate-rugose, not verrucose, elytra a little shorter (2.5:2), not flattened, the asperate sculpture coarser and less close, abdomen less punctured, the punctures more or less biseriate on the anterior segments.

FORMOSA: Kankau (Koshun), vii.1909 (*H. Sauter*). This species has been distributed as *variolosus* Fauv. from which, however, it is quite distinct.

**Trogophloeus (s.str.) formosae** sp.n.

Rather dull, head, thorax and elytra dark ferruginous red, the latter more or less extensively infusate; abdomen more shining, yellowish-red, the last three segments more or less infusate. Antennae reddish, the first two or three segments lighter. Legs reddish-yellow. Length 2 mm.

Very near *silvestris* Cam., but less shining, of lighter colour, the antennae shorter and stouter, the penultimate segments as long as broad; head dull, the puncturation rugose, thorax less shining, broader, more transverse (3.5:2.5), wider in front, more deeply and broadly impressed at the sides; elytra and abdomen as in *silvestris*.

FORMOSA: Kankau (*Sauter*). This was recorded as *silvestris* by Bernhauer (1922, *Arch. Naturgesch.*, **88**:222), but it is quite distinct.

**Trogophloeus (Troginus) formosanus** sp.n.

Very near *exiguus* Er.; of the colour of the said species, but differing in the following respects; the eyes are larger, the thorax longer and more gradually narrowed behind, elytra a little longer than the thorax, slightly transverse. The sculpture as in *exiguus*.

FORMOSA: Takosaki, Mt. Ari, 12.ii.27 (Type, *Yang*). CHINA: Foochow (*Yang*).

**Osorius siamensis** sp.n.

Of the build of *frontalis* Fauv. but larger (7 mm.), more robust and with different sculpture.

Head between the eyes striate, in the middle with an oblong smooth area, the striae not continued on to the declivous part which is shining and coriaceous with a few granules at the sides, the frontal margin is slightly raised in the middle, scarcely emarginate but coarsely crenulate; the penultimate segments of the antennae are moniliform; the thorax is formed as in *frontalis*, with an impression at the rounded posterior angle, along the middle with a narrow impunctate area, elsewhere more finely and more closely punctured than in *frontalis*; elytra longer than the thorax (6:4.5), the puncturation as close but rather finer than in that species; the abdomen much more sparingly punctured than in *frontalis*.

INDO-CHINA: Laos; Pou Mi, 27.xii.18 (*de Salvaza*). Type in my collection.

***Stenus (Hypostenus) coomani* sp.n.**

Moderately shining, black. Antennae and palpi reddish-yellow. Legs black, the femora in the basal half and tibiae towards the apex, red, tarsi reddish-yellow. Length 6 mm.

Very near *cicindeloides* Schall., but a little larger and more robust; the puncturation of the fore-parts a little coarser, but that of the abdomen less coarse and especially on the non-constricted part of the segments much finer and more sparing. The antennae as in *cicindeloides*. This species would appear to be very near *verticalis* Ben., but the head is without a median smooth space. ♂ unknown.

TONKIN: Hoa Binh (*de Cooman*). Unique. My collection.

***Oedichirus chapmani* sp.n.**

Shining; head black; thorax red; elytra black with the posterior third red; abdomen with the first four visible tergites red, the following black. Antennae yellow, the 4th to 8th segments infusate. Legs yellow. Length 7 mm.

Scarcely differing in build and sculpture of the fore-parts from *alatus* Niet., the colour pattern is also similar except that the 4th visible tergite is red whereas in *alatus* it is black, the antennae are distinctly shorter and stouter (and like the legs differently coloured), the penultimate segments only a little longer than broad; the thorax is a little shorter and broader and the puncturation of the abdomen distinctly coarser and closer throughout than in that species.

TONKIN: Hoa Binh. Unique. In my collection. I am indebted to my friend Mr. Chapman for this species.

***Astenus saigonensis* sp.n.**

This species is similar to *maculipennis* Kr. var. *maculatus* Cam. except that the head is of a deep black colour and the elytral spot yet larger, extending nearly to the shoulder and the posterior margin, and also occupies the reflexed margin except at the humeral and postero-external angle.

SAIGON: Two ♀ examples. My collection.

**Charichirus chapmani** sp.n.

Coloration and lustre of *princeps* Fauv., but at once distinguished by the shape and sculpture of the head.

Head as long as broad, a little broader than the thorax, the eyes moderate, temples straight and parallel, the posterior angles almost rectangular, on the middle of the disc with a small almost impunctate area, elsewhere with very close small granules and with the temporal region transversely rugulose. Antennae a little shorter than in *princeps*, the 9th and 10th segments about as long as broad. Thorax slightly broader than long (3.75:3.5), trapezoidal, along the middle with a fine raised shining line, elsewhere closely covered with rather larger granules than on the head. Elytra longer than the thorax (4.5:3.5), the suture very narrowly reddish, the postero-external region from the apex of the suture to the lateral border a little behind the middle, yellow, with as close but rather finer granular sculpture. Abdomen extremely finely, rather closely punctured and pubescent. Length, 6 mm.

♂ unknown.

TONKIN: Hoa Binh. Type in my collection. I am indebted to Mr. Chapman for this species.

**Scimbalium (Schatzmayria) irakense** sp.n.

Very similar to *rufotestaceum* Cam. Of the same build and colour, but with larger eyes and shorter antennae, the penultimate segments only slightly larger than broad, the ground sculpture of the head much less distinct, thorax a little shorter, the puncturation not quite so fine, the elytra as finely but rather more closely punctured, the abdomen as finely but more densely punctured and pubescent. Length 5.5 mm.

From *aegyptiacum* Bernh. it differs in the much shorter antennae, narrower less closely punctured head, much less closely punctured thorax, more finely punctured elytra and more closely punctured abdomen.

IRAK: Baghdad. Unique. My collection.

**Scimbalium (s.str.) persimilis** sp.n.

In colour, build, lustre and antennal structure similar to *anale* Nordm., but differing in the following respects; the puncturation of the head is finer and closer, that of the thorax and elytra as close but distinctly finer, the abdomen much more finely and more closely punctured. Length 10 mm.

MESOPOTAMIA: Tanooma. Type in my collection.

**Leptacinus chinensis** sp.n.

Shining; head black, thorax reddish-brown, elytra yellow infusate at the base, abdomen yellowish-brown. Antennae and legs reddish-yellow. Length 4 mm.

Very near *parumpunctatus* Gyll., of similar build but smaller and narrower, the antennae thinner, the punctures on the head smaller, the thorax with

punctures as in *parumpunctatus*, but those of the elytra much smaller and more superficial; in other respects similar.

S. CHINA: Sheung Shui. Unique. My collection.

***Hesperus chinensis* sp.n.**

Shining; head and thorax dark ferruginous red with very feeble metallic reflex; elytra pitchy black, the shoulders, suture and posterior margin both very narrowly reddish-yellow; abdomen with the first three visible tergites reddish-yellow, the following pitchy, the posterior margin of the 5th reddish-yellow. Antennae yellowish-red with the 1st segment yellow. Legs yellow, the apices of the femora and tibiae slightly infusate. Length 6.75 mm.

In the colour of the body very similar to *inaequalis* Fauv., but smaller, much narrower and the elytra without depressions. Head subquadrate, slightly transverse, much broader than the thorax, the post-ocular region gently retracted to the broadly rounded posterior angles, the eyes moderate, much shorter than the post-ocular region, with four inter-ocular punctures, the median pair distant from one another, the post-ocular region with seven or eight large punctures, otherwise impunctate, the ground sculpture extremely fine, striate and more or less longitudinal. Antennae rather short, reaching the base of the thorax, the 3rd segment longer than the 2nd, 4th to 8th all slightly longer than broad, decreasing in length, the 9th and 10th as long as broad, the 11th very slightly longer than the 10th. Thorax narrow, longer than broad (4.5:3), widest at the anterior angles, on each side of the middle with a row of six large punctures, towards the sides with a puncture a little external to the most anterior of the dorsal row and a group of four external to 3, 4 and 5 of this row, otherwise impunctate except for the usual marginal punctures; ground sculpture absent. Elytra as long as, but a good deal broader than the thorax, transverse, coarsely, moderately closely punctured, more closely at the base and with rather long sparing hairs. Abdomen very finely and very sparingly punctured and with a few fine hairs.

♂ unknown.

CHINA (without further indication). Unique. British Museum.

***Atheta (Aloconota) persica* sp.n.**

Moderately shining, head and abdomen black, thorax dark reddish-brown, elytra yellow, the base and sometimes the reflexed sides more or less infusate. Antennae black, the first four segments and legs reddish-yellow. Length 3 mm.

Except for the broader head, larger eyes, more brightly coloured elytra and much longer antennae, resembling *sulcifrons* Steph. Head subquadrate, a little narrower than the thorax, the eyes as long as the post-ocular region, the disc in the ♂ broadly, superficially impressed, coriaceous and with a few small, obsolete punctures. Antennae long and slender, the 3rd segment slightly longer than the 2nd, 4th to 10th all longer than broad, decreasing in length, the 9th and 10th distinctly longer than broad, the 11th cylindrical, fully as long as the two preceding together. Thorax slightly transverse, formed as in *sulcifrons*, impressed before the scutellum and with a short median impressed line, the sculpture as on the head. Elytra as long as the thorax, very slightly broader

than long, very finely coriaceous and rather closely, very finely and obsoletely punctured. Abdomen very finely and very sparingly punctured, more strongly coriaceous than the fore-parts. ♂. 7th tergite with a large pointed tubercle in the middle: 8th nearly truncate and very obsoletely crenulate, in the middle with two little teeth.

PERSIA: Kerman, 24.x.32 (*H. E. J. Biggs*). Type in British Museum (Nat. Hist.), co-type in my collection.

Zoological Museum,

Tring, Herts.

September 11th, 1940.

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*In observation on Melitta leporina* (Panz.) (*Hym.*, *Apidae*).—Walking across Hampstead Heath late one dull afternoon in July, I happened to see a male of *M. leporina* on a clump of *Achillea*. Stooping to pick it up, I observed the abdomens of several others projecting above the flower-heads, and I counted fourteen of them, head downwards, forming a compact mass; it was not until I started moving them that they showed any signs of life, when they dropped down into the grass and lethargically crawled out of sight, not one attempting to fly away. Other clumps of *Achillea* were examined and several were found to contain smaller groups of males, always head downwards, thirty-five specimens in all being counted. A single female was found on a thistle head some yards away. On a previous hot day, both sexes had been found in considerable numbers visiting the white clover amongst which the *Achillea* grows, the females entering burrows in sandy ground nearby. This bee is particularly numerous in the district this year, and has been found wherever the clover grows at all extensively. I do not doubt that the males passed the night in these groups, but *Achillea* or some plant which would allow them to form compact masses is not as a rule present near the colonies, and it would be interesting to know where the males then go, since a clover head could not support more than two or three of them. Little is known about the nocturnal habits of male bees, but several individuals of *Panurgus calcaratus* (Scop.) have been found curled up together in composite flowers and F. Smith has recorded (1891, *Cat. Brit. Hym.*, 2nd ed., pt. 1:165) males of *Chelostoma* spp. curled up together in flower heads and also attached to blades of grass and twigs by the mandibles, the abdomen held horizontal and the legs stretched out in a line with the body. Perkins observes (*Trans. ent. Soc. Lond.*, 1919:232, 235) that *Nomadas* sometimes sleep clinging by the mandibles to the heads of flowering grasses, dead twigs and leaves, the legs all drawn close to the body and the antennae porrect, so as to resemble a little stalk, while on wet days he has found *Melecta*, *Epeolus* and *Nomada* hanging on to herbage and shrubs, soaked with rain and torpid with cold. On one occasion I found some small male *Halicti* torpid within the flowers of a *Campanula*, and I have often found males of *Bombus* and *Psithyrus* early in the morning, motionless and wet with dew, on lavender heads. Some male bees may pass the night in the entrance to the burrows, this being most probable in species which form colonies and where the males are to be found in the daytime close to the burrows (for example, *Halictus minutus* (Schrank), *Andrena armata* (Gmelin), etc.). Mr. G. E. J. Nixon tells me that many of the smaller wasps roost in holes in posts and that they will do so in holes drilled for this purpose, from which they may be removed during the night. The difficulties of locating insects during the night are obvious, but, except for a few species, all bees and wasps have disappeared



long before it is dark and a little time spent searching might be well repaid.—  
I. H. H. YARROW, Chatsworth House, Riverdale Road, Twickenham, Middlesex: *October 8th, 1940.*

*Yponomeuta evonymellus* L. (Lep.) in *Argyllshire*.—In Meyrick the range of this species is given as England, N. Ireland, local. I have often doubted this distribution, as I have felt that the Northumberland stations for the insect indicated the certainty of its presence in Scotland. This year's events have proved that my beliefs were correct, for I found nests of the larvae very plentifully on *Prunus Padus* L. in Glen Orchy in *Agyllshire*; moreover, I feel certain records must exist for the intervening areas.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne: *October 2nd, 1940.*

### MIMICRY IN ANTS.

BY H. DONISTHORPE, F.Z.S., F.R.E.S.

(PLATE V.)

Fig. 1.—*Myrmarachne* sp., a spider, a very good mimic of

Fig. 2.—*Orthonotomyrmex sericeus* Fab., a widely distributed ant. Mimic and model were taken together by G. M. Henry in Ceylon.

Fig. 3.—*Florencea kirkae* Donisthorpe (1937, *Ann. Mag. Nat. Hist.* (10) 19:624, figs. 5 and 6), a Formicine ant mimicking

Fig. 4.—*Planimyrmex lorai* Emery (1897, *Ann. Mus. Stor. Nat. Genova*, 38:585, Pl. I, fig. 25), a Myrmicine ant, and also

Fig. 5.—*Odontomachus obsolescens* Donisthorpe (1940, *Entomologist*, 73:106), a Ponerine ant.

The mimic *Florencea kirkae* was taken with its Myrmicine model by Miss L. E. Cheesman in Papua, April, 1933, and again in Waigeu by the same collector with its Ponerine model, running together in the same track, in April, 1938. This is a very interesting case of an ant in the subfamily Formicinae mimicking ants in two different subfamilies. The colouring of *F. kirkae* is very unusual for an ant in the tribe Polyrhachini, as is also the formation of the spines (to match those of *P. lorai*). Moreover Formicine ants do not possess a sting, whereas both models possess very powerful ones; they are also normally coloured for their groups. Again, the colour of the gaster of the *Odontomachus* is a little darker yellow than that of the *Planimyrmex*, and in both the Papuan and the Waigeu specimens of *Florencea* the gaster matches the model in question.

British Museum (Nat. Hist.),

London, S.W.7

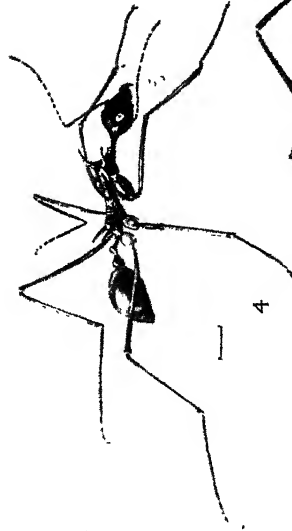
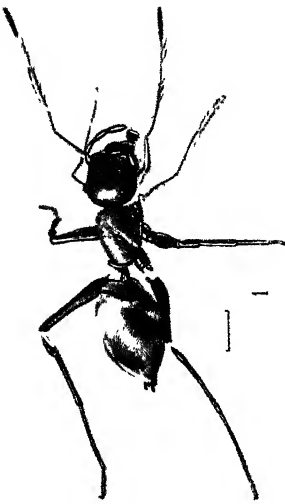
July 18th, 1940.



OFT after G. HENRY



O F TASSART



O F Tassart [mu]

MIMICRY IN ANTS



RESULTS OF THE OXFORD UNIVERSITY CAYMAN ISLANDS  
BIOLOGICAL EXPEDITION OF 1938 (AQUATIC HEMIPTERA).

BY H. B. HUNGERFORD.

All of the specimens under consideration were collected on the Cayman Islands by C. B. Lewis and G. H. Thompson, entomologists for the expedition, during the period from April 17 to August 27, 1938.

HYDROMETRIDAE

*Hydrometra martini* Kirkaldy.—Grand Cayman, July 6, from a 'cow well' midway between Georgetown and South Sound, 6 ♂♂, 5 ♀♀. A 'cow well' is the Caymanians' name for any small, shallow pool, either natural or excavated, and frequently used for watering cattle. These pools are usually about 3 or 4 feet in diameter, rarely over 2 feet deep and nearly always brackish from ocean seepage. Such wells were carefully searched over all parts of the islands, but only one record of *Hydrometra* was made. *H. martini* Kirk is a common species in the United States from Michigan to the Gulf coast.

GERRIDAE.

*Limnogonus guerini* (L. & S.).—Grand Cayman, July 11, from 'cow well' off Further-land Road, North Side. 12 ♂♂, 4 ♀♀. I have this species from Cuba, Haiti, Jamaica, St. Thomas, and Porto Rico, in the West Indies, and from British Honduras, Costa Rica and Peru.

VELIIDAE.

*Microvelia pulchella* Westw.—Grand Cayman, August 4, from 'cow well' near Pedro Bluff, south coast, 7 ♂♂, 9 ♀♀. This widespread species occurs from Maine and Minnesota in the United States southward through Insular America to Brazil and Peru, South America.

*Rhagovelia tenuipes* Champ.—Grand Cayman, June 23, in large numbers under overhanging red mangroves; Ford's Creek (salinity of water at time of collecting, 39.43), 11 ♂♂, 13 ♀♀; Booby Creek (salinity of water at time of collecting, 37.07), 9 ♂♂, 16 ♀♀; a few nymphs taken in both places. This species was described from Mexico.

BELOSTOMATIDAE.

*Lethocerus collosicus* Stål.—Grand Cayman, April 18, Georgetown, at light, 1 ♂. Reported also from Cuba, Jamaica, Yucatan, Panama and Mexico.

*Lethocerus delponter* De Carlo.—Grand Cayman, May 14, East End, at light, 1 ♂; July 16, North Side, at light, 1 ♂. This species has been reported from southwestern United States, Mexico and southward through Ecuador to Paraguay and Brazil. In the West Indies it has been taken in Cuba, Jamaica and Porto Rico.

CORIXIDAE.

*Trichocorixa verticalis* (Fieb.).—Grand Cayman, June 15, 17, and 20, South Sound, light trap, 15 ♂♂, 12 ♀♀. Little Cayman, May 30 and June 1, South Town, light traps, 21 ♂♂, 9 ♀♀. This species is widespread in North America and Insular America.

NOTONECTIDAE.

*Notonecta indica* L.—Grand Cayman, May 9, English cisterns, on the north coast of the island, 1 ♀. This backswimmer is common in United States south

of 37° latitude ranging southward to Colombia, South America. I have it also from Cuba, Jamaica, St. Croix, St. Thomas and Porto Rico.

*Buenoa antigone* Kirk.—Grand Cayman, May 9, English cisterns, 3 ♂♂, 6 ♀♀. The cisterns referred to are of concrete and mark the location of the one-time residence of Savage-English who wrote several accounts of the natural history of Grand Cayman. The house has long since been razed by hurricanes. The largest cistern is about 12 feet in diameter and 22 feet deep. Grand Cayman, August 4, from a 'cow well' near Pedro Bluff, 5 ♂♂, 3 ♀♀. Cayman Brac, May 21, found in large numbers in a sink hole in the 'bluff' limestone in Cotton-tree Land at the west of the island. This hole was about 25 feet across and of a depth undetermined owing to the great accumulation of mud and forest debris. The water was slightly brackish. 24 ♂♂, 21 ♀♀. Cayman Brac, May 22, swarming in thousands, to a depth of at least 6 feet, in a place known as Earthquake Hole, 22 ♂♂, 30 ♀♀ in the collection submitted. This long narrow chasm, popularly believed to have been an earthquake crack, was formerly an opening in the off-shore reef, which as the coastal shelf developed, incorporated it. It is now at least 100 yards from the sea and separated from it by a high coral shingle beach. The width of the 'hole' varies from only a few inches to several feet; it is about 6 fathoms deep and the water is brackish.

*Buenoa pallens* Champ.—Grand Cayman, May 9, English cisterns, 3 ♂♂, 4 ♀♀; August 4, in 'cow well' at Newlands, 7 ♂♂, 7 ♀♀; August 4, in 'cow well' near Pedro Bluff, 16 ♂♂, 58 ♀♀.

*Buenoa elegans* (Fieb.).—Grand Cayman, August 8, Georgetown, light trap, 1 ♂, 2 ♀. This is the same small species that passes under the name *Buenoa elegans* in North America. The type which I have seen in Berlin is labelled 'Brazil,' and there is still a question whether the above species is correctly identified.

Lawrence,

Kansas, U.S.A.

June 8th, 1940.

*Reoccurrence of Eurydema dominulus* Scop. (Hem., Pentatomidae) in its old locality in Mid-Kent.—Some twenty years ago the late Mr. Hubert Elgar, of the Maidstone Museum, informed me that he used to find occasional specimens of *Eurydema dominulus* Scop. near Saw-Pits Lane, Oaken Wood, Barming, until the end of the last century, but had not been able to find any since that time. My house is situated at the end of Saw-Pits Lane, Oaken Wood, and for many years a constant watch has been kept in the hope of finding this handsome Pentatomid bug. None was found, however, until May 17th last, when a male was beaten from hawthorn flower in my garden. A diligent search failed to produce more specimens until July 17th, when a female was obtained while sweeping mixed herbage quite near Saw-Pits Lane. Nine more specimens were taken in August, all by sweeping. A detailed search was made in an effort to find where the bug was breeding, but this hunt was not successful. The bug was not attracted to the flowers of Umbelliferae, which grow in profusion in the same locality. It is not possible to state with certainty with which plant the bug is associated in Oaken Wood, but it is of interest to note that ten of the eleven specimens were swept from Wood-Sage. The record of Hubert Elgar's original captures will be found in the Victoria County History of Kent, published in 1908.—A. M. MASSEE, East Malling Research Station, Maidstone, Kent: October 1st, 1940.

*The Occurrence of Typhlocyba froggatti Baker (Hemipt.) in Kent.*—As already stated by Mr. W. E. China (1939, *Ent. mon. Mag.*, 75:54), *Typhlocyba froggatti* Baker was first recorded as British by Ribaut in the legend to fig. 212 of his 1936 Monograph. Since that date a further British specimen has been presented to the British Museum by Mr. J. M. Brown (1940, *Ent. mon. Mag.*, 76:117). During the latter part of July and August a few opportunities occurred for collecting some of the leaf hoppers associated with cultivated fruits, and a number of species were obtained. For several years past it has been assumed that the two more common species associated with apple are *Typhlocyba rosae* L. and *T. debilis* Dgl. This season, however, very few specimens of *T. rosae* L. and *T. debilis* Dgl. were present on apple, and the predominating species proved to be *Typhlocyba froggatti* Baker. *T. froggatti* Baker is very abundant on apple at the Research Station, and the species is equally common in the apple orchards of many farms in the neighbourhood. It is also quite common on several varieties of plum in the same localities, and also appears to be the only species present on a number of quinces growing at East Malling. *T. froggatti* Baker is also present in numbers on a hawthorn hedge adjoining my garden, but it was not found there until the beginning of September. It seems likely by the abundance of this species in Mid-Kent this season, that it has been associated with fruit trees in this district for many years past, but has been overlooked until recently. *Typhlocyba froggatti* Baker is well known in Australia and New Zealand, and is regarded as a pest of considerable economic importance of apple in those countries. At present it cannot be regarded as an important fruit pest in this country, but in view of its abundance in one of the chief fruit growing centres of Great Britain, it must be regarded with suspicion. The writer is greatly indebted to Mr. W. E. China for his usual courtesy in verifying the identification of the species.—A. M. MASSEE, East Malling Research Station, Maidstone, Kent: October 1st, 1940.

*Hister merdarius Hoff. (Col., Histeridae) in Oxford.*—On April 18th, 1940, this local *Hister* was taken in numbers by Mrs. D. Roper and myself at the base of a heap of grass cuttings under a privet hedge in her garden at Victoria Road, Oxford. The grass cuttings, which were in an advanced state of decomposition, had been practically undisturbed for nearly twelve months, although additions had been made to the heap periodically throughout the previous summer. Altogether forty-two specimens were obtained, nine of which, being immature, were consequently reddish. This is especially noticeable on the pygidium, which is blood-red in colour. The presence of immature examples suggests that *H. merdarius* had bred in the heap, although no larvae were observed. One specimen of *H. cadaverinus* Hoff. was also secured from the same heap. E. W. Aubrook (1939, *Coleoptera in Salzman, L. F., Victoria History of the County of Oxford*, 1:121) gives the following Oxfordshire records: Marston (A. H. Hamm), Water Eaton (J. Collins), Summertown (L. W. Grensted) and Wychwood Forest (J. J. Walker). Fowler (1889, *Coleopt. Brit. Isl.*, 3:201) states that *H. merdarius* is found 'In dung, vegetable refuse, etc.; rare; Forest Hill, Battersea Fields, Horsell, Woking; Aylsham; New Forest; Wisbeach; Nottinghamshire; Herefordshire; Foremark, near Repton,' and in the supplement to the above work (Fowler and Donisthorpe, 1913, *Coleopt. Brit. Isl.*, 6:257) gives the following additional records. 'In refuse heap, Broxbourne, Herts (Jennings); in birds' nests, Enfield (Pool), Bradfield (Joy), Ditchling (Dollman); Huntingfield (Chitty); Water Eaton (Collins); Leighton Buzzard (Crawshay); Suffolk (Morley); Scotland, Merchiston Edin-

burgh (W. Evans).’ Joy (1932, *Pract. Handb. Brit. Beetles*, 1: 473) states that this species is ‘very local; chiefly in birds’ nests.’ J. J. Walker (1932, *Trans. Ent. Soc. S. Engl.*, 7 (2): 113) records it ‘In débris of owls’ nests in old elms near Sheerness East; also fairly common in the “sack-heap” at Queenborough.’ The pages of this magazine have been systematically searched for records back to 1910, the more interesting of which are repeated here:—June 26th, 1911, in ‘old long- [*Cossus*] infested poplar on Ealing Common,’ one specimen (Dollman, H. C., 1912, 48:12). ‘In squirrel’s nest, six in a bat’s resting place in a hole in a tree; not uncommon in rather foul, wet birds’ nests (1, v, vi, viii, ix, x.)’ (Donisthorpe, H. St. J. K., 1937, 73: 239). ‘In small *Cossus*-infested oak, New Forest, June, 1917’ (Walker, J. J., 1917, 53:170). ‘“*Cossus*” oak in Denny Wood,’ New Forest, June, 1932 (*id.* 1932, 68:174). ‘In manure-heap . . . sparingly,’ Oxford, no date (*id.*, 1939, 75:10). I am indebted to Dr. K. G. Blair for kindly verifying my determination.—P. M. MILES, Hope Department of Entomology, Oxford University Museum: October 4th, 1940.

*Spiders and their Prey*.—The following are records of specimens preserved in the Hope Department of Entomology, Oxford University Museum, and are additional to those given in 1931, *Proc. ent. Soc. Lond.*, 5:107-10. The material has been collected sporadically over a period of years by various naturalists, none of whom has paid special attention to the question of the food and food preferences of spiders. Large and conspicuous victims are more likely to attract the attention of an observer than small and obscure species, consequently direct field observations tend to over-emphasize the occurrence of large prey. As W. J. Gertsch (1939, *Bull. Amer. Mus. nat. Hist.*, 76:289) points out, it is well known that ‘crab-spiders will accept as food a large assortment of insects of all orders,’ yet even so there are comparatively few definite records of their prey available and ‘exact data on their preferences are for the most part lacking.’ For determinations I wish to express my thanks to Drs. W. S. Bristowe and A. R. Jackson, Professor L. W. Grensted, the late Mr. F. P. Smith and Mr. G. M. Spooner.

DICTYNIDAE.—*Ciniflo fenestralis* Stroem with *Sarcophaga striata* F., ♂ (Dipt., Tachinidae), Tubney, Berks., 1.vii.06, A. H. Hamm.

THOMISIDAE.—*Misumena calycina* L. with *Empis livida* L., ♂ (Empididae), on thistle, Waterperry Pond, Oxon, 19.vi.39, B. M. Hobby; *E. livida* L., ♀, on thistle, Waterperry Wood, 19.vi.39, B.M.H.; *E. tessellata* F., ♀, Bagley Wood, Berks, 21.vi.32, A.H.H.; *Chortophila* (*s.l.*) sp., ♂ (Muscidae), Cothill, Berks, 12.v.34, E. S. Brown; *Hylemyia strigosa* F., ♂, Cothill, 6.v.34, A.H.H.; *Musca autumnalis* Deg., ♂, Brackley, Northants, 11.viii.35, B.M.H.; *Muscina lardaria* F., ♂, on thistle, Waterperry Wood, 19.vi.39, B.M.H.; *Leucozona lucorum* L., ♀ (Syrphidae), also dead *Empis livida* L., ♀, on same thistle-head, probably old prey, Waterperry Wood, 19.vi.39, B.M.H.; *Platychirus peltatus* Mg., ♂, Bagley Wood, 19.v.40, E. J. Clark; *Syrphus ribesii* L., ♀, Cothill, 6.v.34, B.M.H.; *S. vitripennis* Mg., ♂, Wood Fidle, New Forest, Hants, 3.v.34, E. R. Goffe; *Apis mellifera* L., ♀ (Hym., Apidae), Waterperry Wood, 19.vi.39, B.M.H.; *Bombus hortorum* L., ♀ (Bombidae), Southampton Hants, 23.vi.35, G. A. Hobby; on same thistle-head as dead *B. pratorum* L., ♀, probably old prey, Waterperry Wood, 19.vi.39, B.M.H.; *Plusia gamma* L., ♀ (Lep., Agrotidae), on *Lychnis Flosculi* L., Hell Coppice, Bucks, 21.vi.36, W. F. Burrows; *Hydriomena furcata* Thunb., ♀ (Geometridae), on thistle, Hell Coppice, 31.vii.37, W.F.B.; *H. furcata* Thunb., ♀, Shabbington Wood, Bucks, 1.viii.39, W.F.B.; *Ochlodes venata* Br. and Gr., ♂ (Hesperiidae), on

*Lychnis flosculi* L., Prattle Wood, Oxon, 7.vi.33, E.S.B.; *Polyommatus icarus* Rott., ♂ (Lycaenidae), on buttercup, St. Helen's, I.W., 16.vi.06, E. B. Poulton; *Aphantopus hyperanthus* L., ♂ (Satyridae), Windsor Forest, Berks, 18.vii.33, H. Donisthorpe. *Xysticus excellens* Kulc., with *Anthophagus omalinus* Zett. (Col., Staphylinidae), Billefjord, Norwegian Lapland, 10.vii.36, J. E. Duffield. *X. viaticus* L. with *Phyllobius parvulus* Ol. (Curculionidae), Cothill, 14.vi.36, E. Taylor; *Bibio marci* L., ♂ (Dipt., Bibionidae), Bagley Wood, 26.v.35, B.M.H.; *Maniola tithonus* L., ♀ (Lep., Satyridae), on scabious, Hell Coppice, 3.viii.36, W.F.B. *Xysticus* sp. with *Cantharis rufa* L. (Col., Cantharidae), Foulmere, Suffolk, 21.v.32, G. J. Kerrich; seen to attack *Anaspis frontalis* L. (Col., Mordellidae) which escaped, Waterperry Wood, 19.vi.39, B.M.H.; with *Sminthurid* (Collemb.), Parks, Oxford, 11.vi.31, B.M.H.; *Conops flavipes* L., ♂ (Dipt., Conopidae), Hell Coppice, 21.vii.38, A.H.H.; *Scatophaga stercoraria* L., ♀ (Cordyluridae), Hell Coppice, 19.vi.39, prey alive next morning, B.M.H.; *Apis mellifera* L., ♀ (Hym., Apidae), Middleton Stoney, Oxon, 7.vii.39, B.M.H. ? *Xysticus* sp. with *Empis aestiva* Lw., ♂ (Dipt., Empididae), Cothill, 17.vi.31, B.M.H.; *Dialyta nitida* Macq., ♀ (Muscidae), Bagley Wood, 1938, B.M.H.; *Syrphus venustus* Mg., ♂ (Syrphidae), Brockenhurst, New Forest, Hants, 17.vi.34, E.R.G.; Braconid, ♂ (Hym.), Luccombe Chine, I.W., 11.x.08, H.D. *Philodromus* sp. with *Pegomyia versicolor* Mg., ♂ (Muscidae), Clifton Hampden, Oxon, 12.v.35, E.T.

**SALTICIDAE.**—*Salticus scenicus* L. with *Ciniflo fenestralis* Stroem (Aran., Dictynidae), Parks, Oxford, 24.vii.06, A.H.H.; *Hydrotaea irritans* Fall., ♀ (Dipt., Muscidae), Tubney, Berks, 1.vii.06, A.H.H.; Muscid sp., ♀, Oxford, 7.ix.36, W.F.B. *Salticus* sp. with *Phaonia erratica* Fall., ♂ (Muscidae), Bagley Wood, 13.vi.31, B.M.H.

**ARGYPOIDAE.**—*Araña curcurbitina* L. with *Tenthredopsis nassata* L., ♀ (Hym., Tenthredinidae), Whitefield Woods, Eastbourne, Sussex, 31.v.31, E.B.P. *A. diadema* L. with *Apis mellifera* L., ♀ (Hym., Apidae), Oxford, 13.ix.36, W.F.B.; *Vespula vulgaris* L., 2 ♂♂ (Vespidae), Oxford, 18.ix.33, A.H.H. *A. ? foliata* Fourcr. with *V. germanica* F., ♀, Hogley Bog, Oxford, 8.ix.33, A.H.H. *Araña* sp. with *Graphomyia maculata* Scop., ♂ (Dipt., Muscidae), on teasle head, Kings Quay, I.W., 27.viii.31, E.B.P. Sp. indet with Ichneumonid sp. (Hym.), Cothill, 11.v.34, A.H.H.; Ichneumonid sp., Bagley Wood, 26.v.35, B.M.H.

**THERIDIDAE.**—*Theridion redimitum* L. with *Scatophaga stercoraria* L., 2 ♂♂ (Dipt., Cordyluridae) on *Heracleum*, Bagley Wood, 15.vii.35, A.H.H.; *S. stercoraria* L., ♂, on *Heracleum*, Bagley Wood, 15.vii.35, A.H.H.; *Piptizella vires* F., ♀ (Syrphidae), Shotover, Oxford, 22.vii.06, A.H.H.

**LINYPHIDAE.**—Sp. indet. with *Dioctria atricapilla* Mg. (Dipt., Asilidae), Bagley Wood, 13.vi.31, A.H.H.

**FAMILY INDET.**—Sp. indet. with *Trixa oestroidea* R.-D., ♂ (Dipt., Tachinidae), Bagley Wood, 10.vi.33, B.M.H.

In spider's webs.—*Sitaris muralis* Forst., ♂ (Col., Meloidae), on wall, Iffley, Oxford, 30.viii.06, A.H.H.; *Phragmatobia fuliginosa* L., 7 ♂♂, *Nudaria mundana* L., ♂, ♀ (Lep., Arctiidae), *Maniola tithonus* L., 1 ♂ (Satyridae), Tubney, 28.vi.10, A.H.H.; *Lycaenopsis argiolus* L., ♀ (Lycaenidae), Oxford University Museum, 27.iv.12, A.H.H.; *Pocota apiformis* Schrank, ♀ (Dipt., Syrphidae), Oxford University Museum, 3.vi.13, A.H.H.; *Stenophylax rotundipennis* Brauer, ♂ (Trich., Limnophilidae), R. Thames, Oxford, 11.ix.40, A. D. Grensted.—B. M. HOBBS, Hope Department of Entomology, Oxford University Museum: September 11th, 1940.



*Cumberland Coleoptera*—*new records*.—Since the publication of the last supplementary list of Cumberland Coleoptera in 1933, *Trans. Carlisle Nat. Hist. Soc.*, 5:117-125, a few additional species have been discovered in the county, viz.:—*Cercyon depressus* Steph., St. Bees, 23.v.1936, several in decaying seaweed. (I have also taken it at Port Ling in Kirkcudbright, which adds a little to the very few Scotch records of the species.) *Phytosus nigriiventris* Chevrr., Drigg, 12.vi.1938, two specimens in a dead bird on a sandy beach. *Philonthus jurgans* Tott., Croglin, 7.v.1927, two specimens captured on the wing; I have also one or two others from decayed rubbish in my garden. *Epuraea* (*Micrurula*) *melanocephala* Mm., Talkin, several taken by Mr. S. Campbell of Newcastle-on-Tyne in 1935; I took one in my office, 11.v.1938. *Enicmus histrio* Jy., formerly confused with *E. transversus* Ol.; it is common in the Carlisle district. *Emobius nigrinus* Sturm, Carlisle (1936, *Ent. mon. Mag.*, 72:180). *Lamprosoma concolor* Sturm, St. Bees, 2.vi.1935, taken by grubbing at the roots of low plants. These records bring the number of Cumberland beetles to 1,844 species.—F. H. DAY, 26 Currock Road, Carlisle: October 17th, 1940.

## Reviews.

'COMPENDIUM OF ENTOMOLOGICAL METHODS. Part I. Collecting Mayflies (Ephemeroptera).' By J. R. TRAVER, Ph.D., 8vo, 8 pp., illustrated. New York, Rochester (Ward's Natural Science Establishment, Inc.). 1940. Gratis.

The publishers state that this work will consist of articles by authorities on the specialized methods of collecting, preserving and studying the various Orders of insects, 'of interest chiefly to professional entomologists.' There is ample room for such a contribution to entomological literature, but we trust that the text of future parts will be written less for the novice and more for the professional entomologist and informed amateur, to whom it is planned to distribute the compendium, free of charge, as it is issued. The pages, also the figures, are unnumbered; these are major bibliographical faults at any time, but especially so if, as is suggested in the foreword, it is intended to produce the completed series in book form. Some of the illustrations are quite artistic, but give no help at all to the inquirer seeking assistance in 'entomological methods'; in view of the expense it would have been advisable to replace them with others having a bearing on collecting technique, so increasing the usefulness of a publication for which there could be a large demand.

'PROCEEDINGS AND TRANSACTIONS OF THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, 1939-40.' 8vo, xx+103 pp., 6 pls. 1940. Price 10/6.

In addition to the usual abstracts of proceedings and reports of field meetings, this issue contains the Presidential Address of Dr. H. B. Williams on the genus *Gonepteryx*, an account of two Geometridae (*Ortholitha umbrifera* Prout and *O. scotica* sp.n.) new to Britain (E. A. Cockayne), the introduction to a discussion on 'sugaring' (C. G. M. de Worms), two important papers on hybrids (E. A. Cockayne and C. N. Hawkins), notes on breeding and setting Microlepidoptera (L. T. Ford), and notes on collecting Lepidoptera in Shropshire and North Wales (G. V. Bull). The plates are all good, but Mr. A. W. Dennis' photograph of the eggs of *Aglais urticae* L., used as a frontispiece, is surely one of the most attractive renderings of this difficult subject we have seen.

CRITICAL NOTES ON SOME RECENT SYNONYMY AFFECTING  
BRITISH SPECIES OF DOLICHOPODIDAE (DIPTERA).

BY J. E. COLLIN, F.R.E.S.

The Dolichopodidae have received a considerable amount of attention by continental students in recent years and a number of changes in well-known names have been made, in some cases quite incorrectly, in others on most doubtful evidence. Unless attention is called to these cases without delay the changes will be made in our British List by someone accepting them without enquiry, only to be changed back again later on. In the interests of stability in nomenclature a name in use should not be changed unless the evidence in favour of a change is unassailable; it is far better, where a doubt exists, to retain the name which has been in common use until the doubt be removed.

In these 'notes' I have, for ease of reference, used the order of arrangement adopted in G. H. Verrall, 1904-5, List of British Dolichopodidae, *Ent. mon. Mag.*, **40** & **41**.

*Psilopus* Mg. and *Sciopus* Zell.

The name *Psilopus* Mg. (1824) is preoccupied by *Psilopus* Poli (1795). There has been a doubt as to the status of Poli's genus owing to a statement by Sherborn in his Index Animalium that Poli's name was used as 'a generic term applied to the fleshy parts of certain *Chamae*' (v. Bezzi, 1907, *Wien. ent. Ztg.*, **26**: 53). The facts are that Poli definitely divided the old genus *Chama* (Mollusca) into three genera (one of which he named *Psilopus*) without retaining the old name *Chama* for any of the subdivisions. It has since been established that *Psilopus* Poli is a synonym of the restricted genus *Chama*, but with a different species as genotype. The name *Sciopus* (an emendation of Zeller's name of *Sciapus*) is now generally used by Dipterists in the place of *Psilopus* Mg. *nec* Poli.

*Sciopus contristans* Wied. (1817), *loewi* Beck. (1902), and *maritima* Beck (1918).

*S. loewi* Beck., a new name for *Psilopus flexus* Lw. (1869) *nec* *P. flexus* Lw. (1857) is not a synonym of *S. contristans* Wied. of Becker. It resembles *S. vialis* Radd. and differs from *contristans* Wied. in having in the male (as described by Loew) the last joint of front tarsi slightly dilated, and yellowish patches at sides of abdominal tergites 2, 3, and (less distinctly) 4; it differs from *vialis* Radd. in having basal joint of front tarsi shorter than the tibia. It was added to the British List by Verrall (1911, *Ent. mon. Mag.*,

47: 79, and 1912, 48: 26). A male labelled *vialis* Radd. given to me by the Abbé O. Parent answers better to *loewi* Beck., the *vialis* of his *Faune de France*, 35 (1938) is, therefore, probably *loewi* Beck. *S. contristans* Wied. and *S. maritima* Beck. appear to have been often confused; specimens labelled *contristans* in Kowarz Collection (including one named by Loew) are Becker's interpretation of *contristans* Wied.; but the specimens in Bigot's Collection (received I believe from Mik) were *S. maritima* Beck., and our British *contristans* is also *maritima*. The 'horns' of the internal male genital process are not so angularly bent in my Kowarz specimens of *contristans* as in Becker's figure, but they are distinctly curved, while the longer tarsi are quite distinctive; in *maritima* the length of front tibia compared with that of tarsus is as 23: 35, in *contristans* as 26: 47; in *maritima* the length of first joint of front tarsus in comparison with the combined lengths of other joints is as 16: 19, in *contristans* as 23: 24. I believe that Parent's *contristans* is also *maritima* Beck. If we accept Loew's and Becker's interpretation of Wiedemann's *contristans* that species requires confirmation as British, and *maritima* Beck. takes its place.

*Dolichopus flavipes* Stann. (1831) and *caligatus* Whlbg. (1850).

This synonymy cannot be correct. *D. flavipes* was described by Stannius as having 'Antennae . . . articulis basalibus flavis, supra nigro-fuscis: apicali reliquis latiore, acuminato, nigro-fusco.' Evidently a species with paler and more pointed antennae than *caligatus*. Moreover the type male of *flavipes* was from Marseilles, whereas *caligatus* is a northern, and in Central Europe a mountain species. In Britain *D. caligatus* is known from Scotland only.

*Dolichopus cilifemoratus* Mcq. (1826) and *trivialis* Hal. (1831)

Macquart's description of a large species (3 lin.) with pale basal antennal joints, applies far better to our *cilifemoratus* (*pseudocilifemoratus* Stack.) than to *trivialis* Hal. A small variety mentioned by Macquart with basal antennal joints darkened above may well have been *trivialis* Hal., but Macquart's name must be retained for the larger species. Stannius in 1831 said that he knew only the small variety, which, when he wrote, had not been described as *trivialis* by Haliday. The above two names therefore represent two distinct species.

*Dolichopus migrans* Zett. (1843) and *confusus* Zett. (1843, nec 1838).

When Zetterstedt discovered that his *D. confusus* of 1838 was a synonym of *discifer* Stann. (1831) he quite incorrectly used the

same name (*confusus*) for a distinct species, and this is the *D. confusus* Zett. of our 'List.' Ringdahl by an examination of types has discovered that Zetterstedt described the same species under his alternative section of '*antennae totae nigrae*' as *D. migrans*, which is the now correct name for our species.

*Dolichopus nigricornis* Mg. (1824) and *discifer* Stann. (1831).

This synonymy was accepted by Loew in 1869 after Haliday had reported it as a result of an examination of Meigën's supposed type in Paris. Meigen however attributed the species to Megerle, from whom he had seen an Austrian female only, and this female must be considered the type of the species. If the specimen mentioned by Loew in 1859 as present in the Vienna Museum is Megerle's female, the name *nigricornis* Mg. must be used for *Hercostomus gracilis* Stann. In the meantime the suggested synonymy of *discifer* Stann. with *nigricornis* Mg. should not be accepted.

*Dolichopus notatus* Staeg. (1842) and *puncticornis* Zett. (1843).

Lundbeck was able to compare a specimen of *puncticornis* Zett. from Zetterstedt's Collection with *notatus* Staeg. in Staeger's Collection and found they were the same species. Staeger's name must therefore be used for our British *puncticornis*. Stannius' prior *notatus* (1831) was described as a species of *Ammobates* (*Tachytrechus*), and Staeger's *notatus* as a *Dolichopus*, so that the latter was not a primary homonym of the former, and these names having reverted to separate genera the change of *notatus* Staeg. to *notabilis* adopted by Zetterstedt is no longer necessary.

*Dolichopus fumipennis* Stann. (1831) and *Poecilobothrus principalis* Lw. (1861).

Stannius described the coxae of *fumipennis* as '*anticae pallide-flavae, candido micantes, candido-sericeae, apice nigro-pilosae; posteriores griseae: parte terminali flavescentes*,' whereas in *P. principalis* the hind coxae are yellow like the front pair, and the middle coxae are yellow in front and grey only behind. The synonymy which Becker has suggested ought certainly to be checked by the type (which may be in Vienna, as *fumipennis* was described from specimens taken by v. Winthem at 'Lyon') before it is accepted.

*Dolichopus infuscatus* Stann. (1831) and *Poecilobothrus ducalis* Lw. (1857).

Here again Stannius described the coxae of *infuscatus* as '*apice nigro-pilosae, antice ochraceae, cano-sericeae: posteriores canes-*

centes, apice flavae,' whereas in *P. ducalis* the hairs and bristles on front coxae are all dark, not black only at tip. The type of *infuscatus* (a male) was described from a specimen in the Berlin Museum taken by Hoffmannsegg in Portugal, and, if still in existence, should be compared with *ducalis* before the synonymy suggested by Becker is accepted.

*Poecilobothrus comitalis* Verr. nec Kow.

Verrall added *P. comitalis* to the British 'List' in 1911, *Ent. mon. Mag.*, **47**: 79, and 1912, **48**: 27, on the strength of specimens (previously considered by him to be *ducalis* Lw.) taken at Seaford (Sussex) in 1887, after comparing them with more recently caught specimens of *ducalis* from the Essex coast. I am afraid that he did not allow for the faded condition of the older specimens, for they are certainly only *P. ducalis* Lw., and not identical with a male type of *comitalis* in Kowarz's Collection.

The genera *Gymnopternus* and *Hercostomus*.

Becker's refusal to recognise *Gymnopternus* as distinct from *Hercostomus* has usually been followed in all recent work, but all British species of *Gymnopternus* possess a character not present in any species of *Hercostomus* or allied genera, and that is a small cluster of tiny hairs on the metapleura in front of root of halteres. I therefore retain them as distinct genera.

*Hercostomus germanus* Wied. (1817) and *chaerophylli* Mg. (1824).

These names occur in our British List as separate species, but it seems quite certain that they really represent only one species which must be known as *germanus* Wied. The distinct species some Continental students have called *chaerophylli* (= *conformis* Lw.) has not yet been taken in this country.

*Hercostomus cretifer* Wlk.

Walker himself called attention to the fact that the name *chetifer*, under which the above species was first described in 1849, was a misprint for *cretifer* (an allusion to the colour of last joint of male front tarsi) in the 'Addenda and Corrigenda' of *Ins. Brit. Dipt.*, **3**: xii (1856), and the correction should be accepted.

*Hercostomus bicolor* Mcq. (1827) and *gracilis* Stann. (1831).

This synonymy was first given without any explanation by Schiner. The type of *bicolor* is not in existence, and in view of the fact that the description gives no indication as to whether the species was a *Dolichopus* or a *Hercostomus*, the suggested synonymy is pure guess-work, so the well-known name of *gracilis* Stann. may continue to be accepted.

*Hercostomus nigrilamellatus* Mcq. (1829) and *atrovirens*  
Lw. (1859).

Loew in 1857 recorded the female of this species under Macquart's name, but two years later described both sexes as *atrovirens* n.sp. Parent has examined Macquart's types and found that they are the same as Loew's species. It should in future be known as *nigrilamellatus* Mcq.

*Hercostomus subsimplicipes* Verr.

There does not appear to be sufficient distinction from *H. nigriplantis* Stann. to warrant Verrall's species being considered more than a local race.

*Chrysotus amplicornis* Zett.

Lundbeck has proved by an examination of the type specimen in Staeger's Collection that it was a male of *laesus* Wied. and has given the name of *C. kowarzi* to the *C. amplicornis* Kow. nec Zett. As our British species is the same as that described by Kowarz it must in future be known as *C. kowarzi* Lundbk.

*Thrypticus divisus* Strbl. (1880) and *crassiseta* Oldenb. (1916).

Parent in 1924 attempted to support the unsatisfactory suggestion that the type of *divisus*—a female according to Mik—was a synonym of *T. bellus* Lw. He did not mention that the size of Strobl's specimen (1½ lines), and Mik's redescription of the legs as black with only the knees yellow, would among described species definitely limit it to being either *fennicus* Beck. or *crassiseta* Oldenb., and of these the latter is the only one at present known from Central Europe. Verrall was, therefore, abundantly justified in using Strobl's name for the British species, and this name should be retained.

*Porphyrops riparia* Mg. (1824), *discolor* Zett. (1838) and  
*consobrina* Zett. (1848).

*P. riparia* Mg. was described from the female only, so that the two males (one *consobrina* Zett. and one *penicillata* Lw.) now standing under that name in Meigen's Collection at Paris cannot either of them be the type; nor can Meigen have made a mistake in the sex, because his description of 'Untergesicht, Stirne und Taster graulichweiss' is inapplicable to the male of either *consobrina* or *penicillata*. Meigen's name of *riparia* is used in Kertész's 'Katalog' for *praerosa* Lw., a synonymy which was accepted by

Lundbeck though not by Becker; there may be some justification for this synonymy, but there is none for that of *riparia* Mg. with *consobrina* Zett. *P. discolor* Zett. was also described from the female only, and the male remained unrecognised until Lichtwardt professed to describe both sexes taken *in cop.* on the Island of Borkum, and because Lichtwardt's species was found to be the same as *consobrina* Zett., Becker adopted the synonymy of that species with *discolor*. In view of the large number of species known to occur in Scandinavia, the suggestion that *discolor* Zett., known to its author in the female only, was identical with *consobrina* Zett. described from both sexes, was one that should certainly be supported by a comparison of types before being accepted, and Ringdahl in 1928, when dealing with the Swedish species, decided not to accept the synonymy. It follows, therefore, that *P. consobrina* Zett. should still be used for our British species.

*Porphyrops communis* Mg. (1824) and *spinicoxa* Lw. (1850).

Apart from the fact that the types in Meigen's Collection support the synonymy, the figure of a male given by Meigen showing the genital processes is also confirmatory, and the synonymy should be accepted.

*Porphyrops laticornis* Fln. (1823) and *nemorum* Mg. (1830).

The composite species *laticornis* of Fallén was restricted by Zetterstedt to the species which Meigen described as *nemorum*, so Fallén's name must be used for the species we have been calling *nemorum* Mg.

*Xiphandrium caliginosum* Mg., and *macrocerum* Mg.

As a result of the examination of the specimens now standing under these names in Meigen's Collection in Paris, Parent has suggested that the name *caliginosum* must in future be used for *lanceolatum* Lw. and the name *macrocerum* for *appendiculatum* Zett. He seems to have overlooked the fact that these specimens are, almost certainly, *not* the types. *Rhaphium caliginosum* Mg. was described from 'Ein Männchen von Hrn. Wiedemann' and the type (if it exists) is in the Vienna Museum, while Wiedemann was given as the author of *macrocerum*, and again the type must be sought for in Wiedemann's Collection at Vienna. There is nothing in Meigen's description of *caliginosum* to prevent it being the species we know under that name, and until there is much more definite proof from an examination of the real types, changes in

the use of this name and *appendiculatum* Zett. should not be accepted.

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*Xiphandrium fissum* Lw. of the British 'List.'

The *X. fissum* Lw. as identified by Walker and Verrall is not that species, but *X. albomaculatum* Beck., a species described in 1891, many years after the supposed *X. fissum* had been added to our 'List.' In true *fissum* Lw. the outer lamellae of male genitalia are much shorter and the basal lobe of these lamellae is about half their total length and of similar shape and pointed, not very short and broadly truncate at tip as in *albomaculatum*. In *fissum* also the first joint of front tarsi is quite simple, not slightly thickened at tip beneath as in *albomaculatum*.

*Systemus pallipes* v. Ros. (1840) and *adpropinquans* Lw. (1857).

v. Roser described (!!) his *Rhaphium pallipes* in four words, 'Viride, pedibus pallide flavis.' In 1918 Becker (*Nova Acta Halle*, **103** (3): 224) stated that he had seen the type and it was the same as *Systemus leucurus* Lw. (altered in a subsequent 'Corrigenda' to '*Systemus* sp.!), while on p. 256 without comment he used v. Roser's name for *S. adpropinquans* Lw., in which he has been followed by Parent. As the 'Corrigenda' was the last to appear one can only surmise that Becker finally decided that he could not recognize v. Roser's species. The synonymy, therefore, should not be accepted.

*Syntormon pumilus* Mg. (1824) and *denticulatus* Zett. (1843).

The above synonymy has been suggested by Parent as the result of an examination of the specimens now present under the name *pumilus* in Meigen's Collection in Paris, but he has been too hasty in assuming that these were the types. Meigen's *Porphyrops pumilus* was described from the female only, which at once excludes the *denticulatus* ♂ in Meigen's Collection, apart from the fact that in colour of frons and legs it does not agree with Meigen's description. It should be noted that this included 'Untergesicht weiss; Stirne stahlblau glänzend . . . Beine rothgelb: Vorderschenkel dicht an der Wurzel mit schwärzlicher Binde . . . 1 Linie und drüber.' Without the words 'und drüber,' which may be taken to apply to specimens other than the type, this description is accurate for the species we know as *pumilus* and inaccurate for *denticulatus*. It is certain that it could not have been made from a female *denticulatus* and the synonymy suggested by Parent should not be accepted.



*Syntormon pumilus* Mg. (1824, p. 53) and *rufipes* Mg.  
(1824, p. 30).

Here again Parent found a specimen (he does not state the sex) of our *Syntormon pumilus* under the name *Rhaphium rufipes* (described from the male only) in Meigen's Collection at Paris. He does not explain why Meigen should describe a male *pumilus* as having 'Stirne schwarz' and 'Beine rothgelb mit braunen Füßen,' when *pumilus* has a 'stahlblau' frons, and legs with a dark band at base of front femora and pale base to all tarsi. It is quite certain that the real type of Meigen's *rufipes* was *not* our *Syntormon pumilus* and the proposed synonymy should not be accepted. Nearly all Meigen's species of *Rhaphium* were representatives of the genus *Xiphandrium*, and the figure he gives of the antenna of *Rhaphium rufipes* is more like that of a *Xiphandrium* than a *Syntormon*.

The genera *Medeterus* Fisch. and *Argyra* Mg.

I have prepared revised 'Tables' of the British species of these genera with synonymical notes. These will be published separately later.

#### *Hydrophorus* Fln.

This well-known name is in danger of suppression owing to the fact that Macquart in 1826 suggested *H. jaculus* Fln. as the typical species, while Rondani in 1856 quoted *H. regius* F. (v. particularly Errata to *Dipt. Ital. Prodr.*, 1, which has been overlooked). The acceptance of Macquart's designation would mean the sinking of *Hydrophorus* as a synonym of *Medeterus*, though Macquart proved that he had no intention of so doing, because he retained *Medeterus* as a distinct genus. Rondani's designation of a type would mean using *Hydrophorus* in place of *Liancalus* Lw. In either case the old-established name of *Hydrophorus*, under which numerous species have been described, would disappear. One cannot under these circumstances too strongly urge that the Zoological Commission be requested to place *Hydrophorus* Fln. with type *H. binotatus* Fln. (= *bipunctatus* Lehm.) in the reserved list of generic names.

*Hydrophorus oceanus* Mcq. (1838) and *bisetus* Lw. (1857).

The synonymy in this genus is very involved. Schiner appears to have been responsible for sinking *oceanus* Mcq. as synonym of *praecox* Lehm. but Schiner's *praecox* is said to have been *viridis* Mg.—an improbable species for Macquart to have de-

scribed. Macquart's species was almost certainly either *bisetus* Lw., or true *praecox* Lehm., and it is probably advisable to accept the evidence of specimens found in the Paris Museum under the name *oceanus* Mcq. (which Parent states are *bisetus* Lw.) and use Macquart's name for Loew's species.

*Hydrophorus borealis* Lw. (1857) and *albiceps* Frey (1915).

*H. borealis* Lw. of Verrall and Lundbeck are both certainly *H. albiceps* Frey (v. Parmenter, 1940, *Ent. mon. Mag.*, 76:162). *H. borealis* was a new name suggested by Loew for *H. binotatus* Zett. nec Fln., Zetterstedt having incorrectly restricted the name *binotatus* to the specimens mentioned by Fallén as taken 'e Gottlandia et Nericia.' These particular specimens are therefore the types of *borealis* Lw., and in view of the fact that Zetterstedt had at least two and probably three different species under the name *binotatus* we shall not definitely know how to restrict the name *borealis* until these specimens have been examined. There is, however, reason to believe that Frey correctly recognised the species because of Zetterstedt's description of the facial coloration. The true *borealis* Lw. may yet be found in Scotland.

*Teuchophorus signatus* Zett. (1849) and *pectinifer* Kow. (1868).

These two names certainly represent only one species. Lundbeck's description and figures of the type specimen in Staeger's Collection of *signatus* (described by Zetterstedt as a *Chrysotus*) have been compared by me with the type of *pectinifer* in Kowarz's Collection, and the small differences Lundbeck thought he found in Kowarz's description do not in fact exist. A quite unnecessary complication in the synonymy has been introduced by Becker and copied by Parent. Becker, overlooking the fact that Lundbeck had also examined the specimen of *signatus* in Zetterstedt's Collection (sent to Zetterstedt by Staeger), and found it to be the same as Staeger's specimen in the Copenhagen Museum, came to the conclusion that Zetterstedt's description was made from a specimen of *Teuchophorus simplex* Mik, apparently because Zetterstedt only wrote 'tibiae posteriores sat distincte setulosae' instead of describing the peculiar chaetotaxy beneath the hind tibiae, though it is obvious that Zetterstedt was more impressed by the remarkable costal thickening than by the chaetotaxy of the legs. The fact having been established that Staeger's *C. signatus* described by Zetterstedt (1849, *Dipt. Scand.*, 8: 3065) was a *Teuchophorus*, the publication by Zetterstedt on p. 3096 of an extract from

Staeger giving the differences between a '*Medeterus signatus* Staeg.' and *D. spinigerellus* Zett. lose all importance, for both *Medeterus signatus* and *Chrysotus signatus* are obviously species of *Teuchophorus* and consequently the former becomes a homonym of the latter.

*Sympycnus cirrhipes* Wlk.

It should be noted that *S. cirrhipes* Kow. is not the same as *cirrhipes* Wlk. Kowarz's species has been renamed *S. kowarzi* by Parent. Kowarz described the true *cirrhipes* Wlk. as *pullatus*, while his *brachydactylus* is probably only a local form of the same species.

*Sympycnus annulipes* Mg. and *desoutteri* Par.

Parent has divided *S. annulipes* Mg. into two species without undertaking an examination of Meigen's type which is probably in v. Winthem's Collection at Vienna; he retains the name *annulipes* for a species in which the third antennal joint of the male is rather longer (longer than deep at the base) and more pointed, and of the female (as usual) shorter (about as long as deep at base), more resembling in size that of the male of the second species. This antennal character appears to be the only difference between the two forms, and the one we have been calling *annulipes* has the shorter antennae and answers to Parent's second species, *desoutteri*. At present, therefore, Parent's *S. annulipes* Mg. requires confirmation as a member of the British fauna, but until Meigen's type of *annulipes* is examined we do not know with which form Meigen's name should be associated. There is, however, an earlier name (*pulicarius* Fln., 1823) which will have to be used for one of the above species because Fallén's description of '*Pedes pallidi*, femoribus . . . anticis prope ad basin . . . nigris' definitely rules out the possibility of using this name for *aeneicoxa* Mg. Fallén also did not describe a 'var. a' and 'var. b' as indicated in Kertész, 1903, *Katalog. Paläarkt. Dipt.*, 2:348. This was done by Zetterstedt in *Dipt. Scand.*, 2, and the identity of Zetterstedt's var. b. with *aeneicoxa* Mg. seems most improbable in view of the two facts: (1) that he described the male as 'in ceteris var. a simillimus,' and this included 'tarsis posticis articulo tertio latere interiore barbato'; and (2) that his next species (*brevicornis*), which he compared with *pulicarius*, is acknowledged as the true *aeneicoxa* Mg. *S. pulicarius* Fln. Zett. must, therefore, be either *annulipes* (Mg.) Parent or *desoutteri* Par.

*S. annulipes* (Mg.) Parent appears to be the common European species, and according to Lundbeck's description extends also into Denmark, while Zetterstedt stated that he received Danish specimens of *pulicarius* from Staeger. There is no evidence at present that *S. desoutteri* Par. occurs in either Denmark or Sweden, though it is certainly common in the extreme North of Scotland. For the present, therefore, it may be better to use the name *S. desoutteri* Parent for our British species, though it is still possible that it may sink as a synonym of *pulicarius* Flin.

Raylands, Newmarket.

October 1st, 1940.

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*Psectra diptera* Burm. (Neur., Hemerobiidae) at Woodwalton Fen, Hunts.—In the Ray Society volumes on the British Neuroptera (1:250 (1936) and 2:258 (1937), F. J. Killington states that only seven specimens of this Hemerobiid were known to have been taken in the British Isles, and that the species is regarded as very rare throughout its range, which covers parts of Europe, Siberia, and the U.S.A. The capture of three further specimens which Mr. D. E. Kimmins of the British Museum (Natural History) has very kindly identified, should therefore be recorded. The first of these specimens, a macropterous female, was found on August 20th, 1939, under cut grass at the side of the main drove at Woodwalton Fen, the small size of the insect suggesting that it was something unusual. On a visit to the fen on August 18th, 1940, a definite search was made for the species, and two specimens—a micropterous male and macropterous female—were found under the grass left by the side of a path which had recently been mown, the site being about 250 yards from that of the 1939 capture. When shaken out of the grass the female was sluggish and made no attempt to fly, but the male was very active, skipping from place to place in a manner suggestive of a Collembolan. How it managed to jump was not precisely observed, but since its legs are comparatively feeble it must presumably use its single pair of developed wings to assist in the process. Both male and female were kept alive in the hope of obtaining eggs, but neither survived long and the opportunity of discovering more about the habits of the insects was lost. Since nothing is known of the larva, it may be mentioned that sometime in 1938, probably April 9th, a very minute and curious larva was shaken out of a tuft of grass on the fen. This larva inhabited a black curved case (rather like that of a young *Coleophora anatipennella* Hubn.) in which it remained so hidden that little more than its jaws, the front of its head, and on rare occasions its legs were visible. From what could be seen, however, the larva had the characteristics of a Hemerobiid, and out of curiosity it was kept alive for some months, feeding apparently on small collembola and other minute creatures which it found in pieces of moss that were given it from time to time. Unfortunately the insect was thrown away by mistake and its identity was never established, but it would seem possible that it may have been the undiscovered larva of *Psectra*.—J. C. F. FRYER and H. M. EDELSTEN, Plant Pathological Laboratory, Milton Road, Harpenden: November 13th, 1940.

## SOME RECENT DISCOVERIES IN THE BRITISH INSECT FAUNA.

BY R. B. BENSON, M.A., F.R.E.S., K. G. BLAIR, D.SC., F.R.E.S.,  
AND H. DONISTHORPE, F.Z.S., F.R.E.S.

(Plate VI.)

Fig. 1.—*Laphria gilva* L. (Dipt., Asilidae); Blair, 1938, *Ent. mon. Mag.*, **74**:154.—This striking addition to our fauna was found in Windsor Forest sitting upon pine trunks in the sunshine. A single specimen was first taken on June 12th, 1938, further examples being subsequently secured on July 26th.—K.G.B.

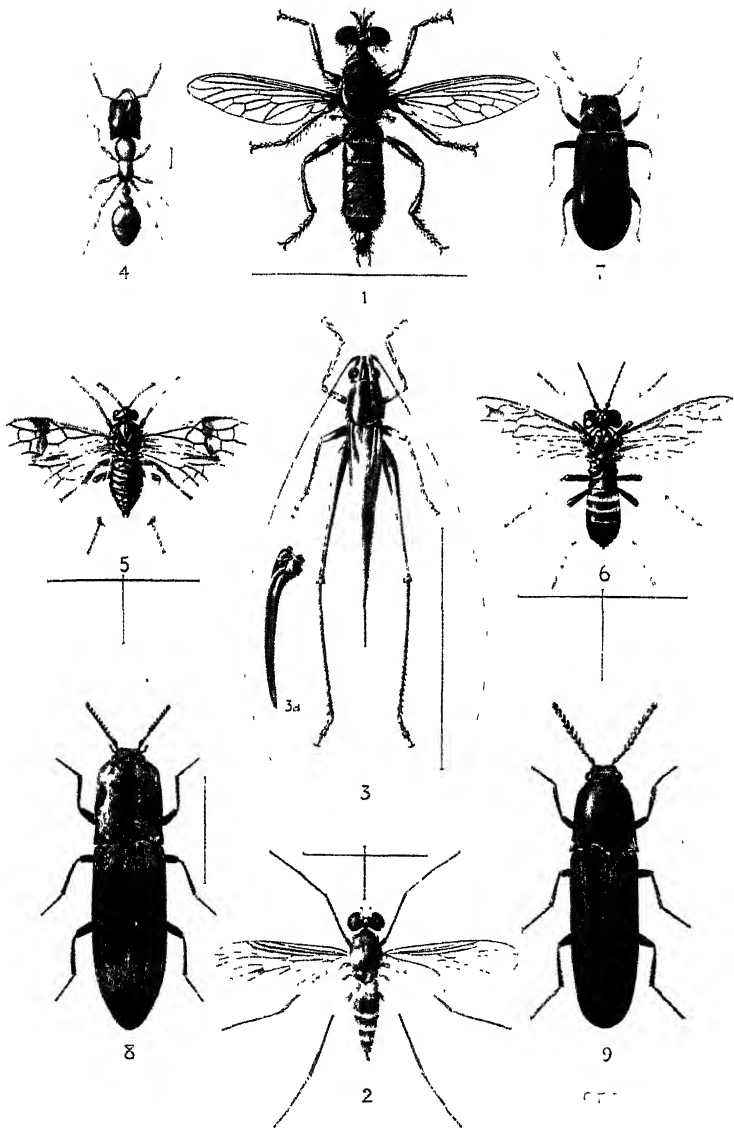
Fig. 2.—*Chrysopilus laetus* Zett. (Dipt., Rhagionidae); Oldroyd, 1939, *Ent. mon. Mag.*, **75**:12 (as *C. nubecula* Fall.), and Collin, *t.c.*:278.—Bred by Mr. Donisthorpe from a pupa found in the mud bordering a pond in Windsor Park on June 18th, 1938. Little appears to be known about the species on the Continent.—K.G.B.

Fig. 3.—*Conocephalus fuscus* Fab. (Orthopt., Tettigoniidae); Blair, 1936, *Ent. mon. Mag.*, **72**:273-4.—Taken on the undercliff of the Isle of Wight near Chale in September, 1931, but assumed to be the macropterous form of *C. dorsalis* Latr. The latter, however, has the dark dorsal mark broader and more triangular, widening strongly from apex to base, and less sharply defined; in the female the ovipositor is shorter (9 mm. compared with 15 mm. in *fusca*) and more strongly curved. Mr. H. G. Jeffery of Newport has since taken the species, which appears to be always macropterous, while in *C. dorsalis* this form is rare. On the Continent *C. fuscus* is much the commoner and more generally distributed species.—K.G.B.

Fig. 4.—*Strongylognathus diveri* Donisth. (Hym., Formicidae); 1936, *Ent. mon. Mag.*, **72**:111-6.—This interesting ant was discovered at Studland, Dorset, by Capt. C. Diver, in company with *Tetramorium caespitum* L., the genus as well as species being new to Britain. Males were subsequently reared in captivity.—H.D.

Fig. 5.—*Arge metallica* Klug (Hym., Symphyta); Stelfox, 1928, *Ent. mon. Mag.*, **64**:14-15.—This metallic sawfly with a yellow flagellum to the antenna, and in the female with banded wings, is only known as British from one or two Irish specimens taken in recent years. It was first recorded by Mr. A. W. Stelfox.—R.B.B.

Fig. 6.—*Tenthredo rossii* Panzer (Hym., Symphyta); Benson, 1938, in *Zoology of Cambridgeshire*, Victoria County History of Cambridgeshire and the Isle of Ely, **1**: 162.—This wasp-like sawfly differs from related British species in that the head is swollen



O. F. Tassart [mu]

SOME RECENT DISCOVERIES IN THE BRITISH INSECT FAUNA



behind the eyes and is, with the antennae, entirely black. It was found long ago by Stephens near London and by Dale near Bristol; in recent years it has been rediscovered at Wicken Fen by the late E. B. Nevinson and others.—R.B.B.

Fig. 7.—*Gastrallus laevigatus* Oliv. (Col., Anobiidae); Donisthorpe, 1936, *Ent. mon. Mag.*, 72:200.—Taken in some numbers by Mr. Donisthorpe on cut elm logs in Windsor Park, 19th July, 1936. Both genus and species were new to our fauna.—K.G.B.

Fig. 8.—*Adelocera quercea* Herbst (Col., Elateridae); Allen, 1936, *Ent. mon. Mag.*, 72:67-9.—This fine Elaterid is recorded by Stephens as having been taken in Windsor Forest by G. H. Griesbach, but has since remained lost to us until rediscovered by A. A. Allen. It is a rare species on the Continent.—K.G.B.

Fig. 9.—*Limoniscus violaceus* Müll. (Col., Elateridae); Allen, 1937, *Ent. Rec.*, 49:110.—Another handsome Elaterid discovered in Windsor Forest by A. A. Allen, both genus and species being new to Britain.—K.G.B.

British Museum (Natural History),  
London, S.W.7.

July 18th, 1940.

*New County and Vice-County Water Beetle Records within the North Scottish Area.*—It seems advisable to put on record the following county and vice-county records, apparently hitherto unpublished, as there are still many gaps to be filled in in our knowledge of the range of many quite common species. Furthermore, comparatively little collecting has been done in the far north of Scotland, though Professor Balfour-Browne has published two relevant papers within recent years (2, 3: these, and subsequent numbers in parentheses, refer to the list of references at the end of these notes). I have also an additional number of records for West Ross-shire, but I am withholding these for the present as I hope to deal with that district more fully in a future note after further collecting expeditions there. All the records here given refer to the Scottish mainland north of a line from Elgin to Strome Ferry. Professor Balfour-Browne has kindly examined many of the specimens for me, and has provided me with information about their known distribution. (In the county-symbols here used the letters SS and NS of course refer to Sutherland and not to Somerset.)

HALIPLIDAE.—*Brychius elevatus* Pz.: I took two specimens in the R. Helmsdale, near the town of that name, SS, on 3.vi.40. This is nearly always a rare species in this area, in my experience. Only once did I find it really common. That was in the R. Thurso, CA. *Haliplus confinis* St.: common in one very limited area of Loch Eye, near Fearn, RE, on 20.v.40. On a revisit only a month later I was unable to find it again; either it had scattered itself over a wide area of the loch, or it had gone into the deeper water. *H. ruficollis* De G., *wehnckei* Gerh., and *lineatocollis* Marsh.: Loch Migdale (near Bonar Bridge), SS, 13.v.40.

DYTISCIDAE.—*Hygrotus 9-lineatus* St.: Loch Migdale, SS, 13.v.40. *Deronectes latus* St.: not uncommon in the R. Helmsdale near the township of that name, SS, 3.vi.40. This appears to be the most northerly Britannic record for the species. *Oreodytes septentrionalis* Gyll. also occurred in the R. Helmsdale on



the same date. *Graptodytes pictus* F.: Professor Balfour-Browne (1; 255-7) writes of this species: 'In 1938 D. J. Gordon sent me an MS. list of his captures around Strathpeffer (East Ross), and included this species from one locality, but it is clear that *pictus* is rare in the north, even if it is actually established there.' So far I have only met with a single example in RE in a burn-fed open pool on the Black Isle, at Leanaig, near Cononbridge. An interesting capture was that of *Hydroporus lepidus* Ol. in Caithness. It occurred very commonly (with *Haliplus obliquus* F.) in a quarry-pool near Achunabust, Reay, only a few miles away from the NS border, on 30.vii.40. Balfour-Browne (1; 267) states that he failed to find it in Caithness or Sutherland in 1930. This is therefore the most northerly record for this species. The same author writing of *H. tessellatus* Drap. (*lituratus* Brull.) (1; 353) states that in Scotland the mainland records for this species are all southern. Recently I have taken two specimens on different occasions in RW in the Strathcarron neighbourhood. This is not surprising, as the species has been found on Skye. *Agabus congener* Payk. I found in a swamp near Forbes, EL, on 15.vii.40.

GYRINIDAE.—*Gyrinus caspius* Mén. (*elongatus* Aub.). One specimen was taken on 6.vi.40 in Loch Achnacloich (otherwise very unproductive), Alness area, KE.

HYDROPHILIDAE.—*Berosus luridus* L. was not uncommon in a grassy pool near Muir of Ord, RE, on 4.v.40. This was a particularly interesting find as, so far as I can ascertain, the only published record for north of Yorks SE and SW is the 1870 record of Hislop for Elgin; though Fowler (4; 230) states for this species: 'Scotland, rare, Solway and Moray districts.' It is evident that he knew of Hislop's record. *Hydraena gracilis* Germ.: I took a single specimen of this species in the Halladale River near Melvich, NS, on 30.vii.40. It has not been recorded from Sutherland (or Caithness either) before (3; 174).

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  - (2) ——— 1930. The Aquatic Coleoptera of Caithness and Sutherland, *Scot. Nat.*, 1930: 171-88.
  - (3) ——— 1938. The Aquatic Coleoptera of Ross and Cromarty (East and West Ross). *Ibid.*, 1938: 129-34.
  - (4) FOWLER, W. W. 1887. *The Coleoptera of the British Isles*. London. 1.
- E. J. PEARCE, c/o The House of the Resurrection, Mirfield, Yorks.: October 3rd, 1940.

*The Range of Argynnis aglaia* (L.) (Lep., Nymphalidae) in the Outer Hebrides.—Although the detection of this species in the Outer Isles is a matter of recent history, it is known to be of common occurrence in many of them. Thus our various expeditions have reported it from Berneray (Barra Isles), Mingulay, Pabbay (Barra Isles), Sandray, Flodday, Muldoanich, Vatersay, Barra, Fuday, Eriskay and South Uist, on all of which it is attached to *Viola Riviniana* Reichb. and *V. Curtisii* Forst. as food plants. However, at no time had we seen it north of the Daliburgh area of South Uist, either on that island or others. It was, therefore, with considerable surprise that we discovered a single example on Benbecula this season. In view of our careful examination of Lewis, Harris, North Uist and other northern islands, and our failure to note it there, this specimen must be regarded as a 'straggler.' There are certain biogeographical reasons for expecting its distribution northward to cease in the southern part of S. Uist.—J. W. HESLOP HARRISON, King's College, Newcastle-upon-Tyne: October 2nd, 1940.

RESULTS OF THE OXFORD UNIVERSITY BIOLOGICAL  
EXPEDITION TO THE CAYMAN ISLANDS, 1938.  
SPHINGIDAE (LEP.).

BY KARL JORDAN, PH.D., F.R.S.

The Hawkmoths obtained by the Oxford University Cayman Islands Expedition in the summer of 1938 are the first we have seen from the Caymans. The majority of the species obtained are of very wide distribution in the Americas; others are represented by subspecies confined to the West Indies and two subspecies are new. The specimens were chiefly collected by Messrs. C. B. Lewis and G. H. Thompson; a few were taken by Mr. A. W. Cardinall and these are indicated by his initials.

*Herse cingulata* Fabr., 1775.—Grand Cayman, 14.v, 1 ♀. Little Cayman, 2.vi, 1 ♂. Both specimens in a light trap.

*Cocytius antaeus antaeus* Drury, 1773.—Grand Cayman, West end of Georgetown, 27.viii, 1 ♀. There is no constant difference between the Continental and West Indian specimens. In the present female the lines of the forewing are rather conspicuous on a greyish-green ground.

*Protoparce sexta jamaicensis* Butler, 1877.—Cayman Brac, 18.v, dusk at light; 25 and 26.v, 2 ♂♂, in light trap. Grand Cayman, 18.iv, 1 ♂; 13.v, 1 ♀; West end of Georgetown, 30.iv, 1 small ♂; all in light trap. The forewing is only 37 mm. long in the Georgetown specimen; the genitalia are the same as in examples of normal size.

*P. rustica cubana* Wood, 1915.—Grand Cayman (West end of), Boilers, inland from Jackson, 29.iv, 1 ♂; West end of Georgetown (A.W.C.), 2 ♀♀. The subspecies differs from *P. r. rustica* Fabr., 1775, chiefly in the pale discal band on the upperside of the forewing being broadly interrupted in all specimens, while the band is more or less complete in almost every example of *P. r. rustica*.

*P. brontes cubensis* Grote, 1865.—Little Cayman, South Coast of South Town, 29, 30 and 31.v, 5 ♂♂, 1 ♀; 2 and 8.vi, 2 ♂♂. Grand Cayman (East end of), 1.vii, 1 ♂. Nearly all obtained in light trap. The male from Grand Cayman is the largest, the forewing being 44 mm. long, while in the specimens from Little Cayman the measurements are: males 33-38 mm., female 42 mm.; it may represent a new subspecies, but is too much worn for diagnostic purposes.

*Protombulix strigilis* L., 1771.—Grand Cayman, West end of Georgetown, one pair (A.W.C.).

*Pseudosphinx tetrio* L., 1771.—Little Cayman, West end of Cross-the-Land Road, larvae on 'jasmine,' pupated 5.vi, emerg. 25.vi, 1 ♀; pupated 6.vi, emerg. 26.vi, 2 ♀♀; pupated 7.vi, emerg. 27.vi, 1 ♀. Grand Cayman (East end of), 29.vi, in trap by Manse, 1 ♂; West end of Georgetown, 9.viii, 1 ♂.

*Erinnyis alope* Drury, 1773.—Cayman Brac, North coast of Stakes Bay, on ♀-flowers of Paw-paw at dusk, 18.v, one pair; 26.v, 1 ♀.

*E. ello* L., 1758.—Cayman Brac, North coast, Stakes Bay, on ♂-flowers of Paw-paw, 26.v, 1 ♀; Grand Cayman, North side, Hut Road, 15 and 17.vii, 2 ♀♀; West end of Georgetown, 1 ♀ (A.W.C.).

*E. oenotrus* Stoll, 1780.—Grand Cayman, South Coast, South Sound, 19.vi, 1 ♂ in light trap.

*E. obscura obscura* Fabr., 1775.—Grand Cayman, North Sound, Booby Bay, 6.v, 1 ♂, and east end of island, East End, 1.vii, 1 ♂, both specimens in light trap; West end of Georgetown, 1 ♀ (A.W.C.).

The preceding six species are very widely distributed in tropical and subtropical America.

*Cautethia grotei hilaris* subsp. nov.—Cayman Brac, Bluff near East end of Spot Bay, 23 and 24.v, 3 ♂♂; North Coast, Earthquake Hole, 24.v, 2 ♂♂; North Coast, Stakes Bay, 28.v, 1 ♂; all in light traps. Ground of upperside of forewing more whitish-grey than in *C. grotei* Edwards, 1882, from Florida, Cuba and the Bahamas, the black lines contrasting more strongly with the ground, the teeth of the discal zigzag line sharp proximally and distally, the three anterior black spots of the next discal line conspicuous, the posterior sections of these lines on the inside of tornus both strongly marked and less oblique than in *C. g. grotei*. On hindwing the proximal edge of marginal band not very sharply defined and more or less tawny. Dull orange area on underside of hindwing somewhat variable in size as in *C. g. grotei*, not sharply defined, washed with tawny, especially on costal and distal sides. Genitalia as in *C. g. grotei*. Length of forewing 14.5–16 mm.

*C. grotei apira* subsp. nov.—Grand Cayman, West end of Georgetown, 19.iv, 1 ♂; West Bay, 17.vii, 1 ♂; both in light trap. In colour almost exactly like the male of *C. g. grotei*; oblique line at tornus of forewing shorter, orange area of hindwing above and below somewhat deeper in tint; anal sternum apically broader, with the two prongs longer than in *hilaris* and *grotei*.

In Rothschild and Jordan, 1903, 'A Revision of the Lepidopterous family Sphingidae,' *Nov. Zool.*, 9 (Suppl.): 414, the Cuban specimens of *Cautethia* are placed under *C. noctuiformis* Walk., 1856. At that time we had only some females labelled Cuba and with them a few males without locality label, which we erroneously assumed also to be from Cuba. The considerable material received since from that island proves the Cuban *Cautethia* to be *grotei grotei*.

The type of *C. noctuiformis* came from St. Domingo; its surprisingly distinct genitalia agree with those of the above non-labelled males, which, presumably, also came from St. Domingo or Haiti. I take the opportunity to mention that the male genitalia of *C. yucatanana* Clark, 1919, *Proc. New Engl. Zool. Club*, 6: 107, pl. 12, fig. 3 (*Ysamal, Yucatan*), are different from those of *C. spuria* Boisd., 1875 (Mexico). My late friend described the species from a pair, selected the female as type and figured it and sent me the paratype for the Tring collection. The anal tergite is stouter than in *C. spuria*, truncate as in that species, but with the apical surface larger; the apical, curved-up, setiferous lobes of the anal sternite are longer in a ventri-dorsal sense and the transverse ridge below this pair of processes, which appears as a sharp tooth in a lateral aspect in *C. spuria*, is absent; the

penis-sheath and clasper are as in *C. spuria*.

*Sesia tantalus zonata* Drury, 1773.—Grand Cayman, North Coast, North side of Hut Road, 10.vii, 1 ♀. A little above average size, length of forewing 24 mm. The greater part of the upperside of body and forewings discoloured to russet.

*Pholus vitis vitis* L., 1758.—Cayman Brac, North Coast, Stakes Bay, on ♂-flowers of Paw-paw, 18.v, 1 ♂, 2 ♀♀, and 26.v, 1 ♀; interior behind Stakes Bay, 21.v, in light trap; North Coast, Stakes Bay, at light in Court House, 27.v, 4 ♀♀; East end of Cayman Brac, Bluff near Spot Bay, in light trap, 24.v, 1 ♂. In three of the females the white markings on the upperside of the forewing are a dull fawn colour and the normally dark green patches more or less amber-brown, apparently due to discoloration.

*P. fasciatus* Sulzer, 1776.—Grand Cayman, West end of Georgetown, 1 ♀, (A.W.C.).

*P. labruscae* L., 1758.—Grand Cayman, West end of Georgetown, 6.viii, in light trap, 1 ♀.

*Xylophanes pluto* Fabr., 1777.—Grand Cayman, West end of Georgetown, 17.iv, 12.vi, and 14.vi, in light trap, 3 ♀♀.

*X. tersa* L., 1771.—Little Cayman, East Coast, South Town, in light trap, 30.v, 2 ♂♂, 31.v, 4 ♂♂, 2.vi, 3 ♂♂, 3.vi, 1 ♂.

*Celerio lineata lineata* Fabr., 1775.—Cayman Brac, West end, Cotton-tree land, 20.v, 1 ♂; Little Cayman, East end, 5.vi, 1 ♀; South Coast, South Town, 8.vi, 1 ♀. All in light trap.

British Museum (Nat. Hist.),

Zoological Museum, Tring.

August 22nd, 1940.

*Pachytomella parallela* Mey. (Hem., *Capsidae*) in *Roxburghshire*.—I met with males of this Hemipteron in great numbers on the banks of the River Teviot at Jedfoot on June 9th last. The day was bright and warm and the bugs were flying and skipping among the long grass overhanging the stream and could be caught in the hand. Not recognising the insect I took a good many specimens, but there were no females, which are brachypterous and very unlike the males. The latter, as remarked by Butler (1924, *Ent. mon. Mag.*, 60:8), is very like a black *Plagiognathus arbustorum* F. I have already recorded the female from Scotland (1936, *Ent. mon. Mag.*, 72:279), which was the only sex in which I knew the species. Mr. W. E. China, in kindly naming the male for me, tells me he has taken that sex this year (1940) by sweeping sparse grass along a roadside in Surrey.—F. H. DAV, 26 Currock Road, Carlisle: October 17th, 1940.

*Hister merdarius* Hoff. and *Gnathoncus nidicola* Joy (Col., *Histeridae*) in *Surrey*.—Mr. P. M. Miles' list of localities for *Hister merdarius* Hoff. (*antea*, pp. 257-8) prompts me to add Great Bookham, Surrey. I have taken this beetle singly on three occasions, *viz.* in rotting grass cuttings in my own garden on November 15th, 1936, and December 3rd, 1939; and on August 11th, 1940, in a starling's nest in a hole in an oak tree, on Bookham Common, in company with several specimens of *Gnathoncus nidicola* Joy.—A. M. EASTON, Roadside Cottage, Lower Road, Great Bookham: November 7th, 1940.

## THE ODONATA OF THE INNER AND OUTER HEBRIDES.\*

BY PROF. J. W. HESLOP HARRISON, D.SC., F.R.S., AND

G. HESLOP HARRISON, B.SC., PH.D.

During the course of our wanderings in the Western Islands of Scotland in search of material for our Flora of the Inner and Outer Hebrides, we have naturally devoted a considerable amount of time to the water plants. This, in turn, has almost inevitably led to our collecting and studying the insect fauna of the multitudinous lochs and streams with greater or less intensity. Amongst the groups so examined were the Odonata or dragonflies. Although our investigations have necessitated our presence on various islands in every month from April to November, we have not spent such a period on each island. Therefore, whilst claiming that our results afford a broad picture of the distribution of the Hebridean dragonflies, we cannot regard it as complete in every detail.

However, our knowledge is extensive enough to warrant the assertion that the Inner and Outer Isles support much the same set of species, although certain significant differences manifest themselves. Thus, *Lestes sponsa* Hans., whilst common enough around weed-choked pools in the northern members of the Skye group of islands (Watsonian vice-county 104), becomes excessively rare in the Small Isles Parish (Rhum, Eigg, Canna and Muck) of the same group, and fails entirely in Coll and Tiree (v.-c. 103) and in the Outer Isles (v.-c. 110). It is true that Dale (1884, *Ent. mon. Mag.*, 20:213) records it from North Uist (not Lewis as quoted in the Natural History of Barra, 1936, *Proc. R. Phys. Soc. Edinb.*, 22:273), and that Miss C. Longfield reports it in 1937, *Dragonflies of the British Isles*:153, as occurring in the Outer Hebrides. Nevertheless, despite the great amount of work done by the Edinburgh expedition and ourselves, none of us have encountered it in the 'Long' Island. We believe that, in the case of Dale, some unexplained error has arisen, and that Miss Longfield was repeating his record. Similarly, *Coenagrion puella* L., given by Dallman for Lewis (1931, *Northw. Nat.*, 6:229), has been seen by no one else in the Outer Isles, and has only occurred to us on Raasay, where we observed it in very small numbers. However, *Cordulegaster boltonii* Don., very common in the same Skye Islands as *Lestes sponsa*, occurs more or less freely on Rhum and Eigg in the Small Isles Parish, but thins out

\* We are only concerned with those islands belonging to the Watsonian vice-counties 103, 104 and 110.

on Coll and Tiree, reappearing sparsely in the southern half of the Outer Islands. *Aeshna cyanea* L., stated by Miss Longfield to be absent from Scotland, turned up in South Rona in 1933 and in Raasay in 1936 and 1937, in each case as isolated individuals. Lastly, *Somatoclora arctica* Zett. was discovered in Rhum in 1938, but, like the preceding species, it has not as yet been detected in the Outer Group. This occurrence on Rhum extends its known range from the mainland to the Western Isles.

#### COENAGRIIDAE.

*Pyrhosoma nymphula* Sulz.—Fairly common in the larger isles of the Outer Group, but lacking on the Isle of Vatersay and those southward thereof. In the Inner Isles it is quite common even on Muck and its satellite Eilean nan Each.

*Ischnura elegans* Van der Linden.—Commonly and generally distributed. Its range extends to Hyskeir, an isolated reef lying a dozen or so miles south of Rhum, where its habitats are one or two tiny, brackish, peaty pools near the lighthouse. The insect also occurs on the more remote isles like Mingulay, Sandray, Vatersay, Monach Isles, Taransay and Berneray (Sound of Harris).

*Enallagma cyathigerum* Charp.—Equally plentiful, and of much the same distribution. Although Benbecula produced only two species, this was one of them. That only a few Odonata were noted on that island was due to the high winds prevailing during our visit; the island should yield at least seven species.

*Coenagrion puella* L.—Very rare indeed; only observed, and in very small numbers, in the Brochel and Torran district in the north of Raasay.

#### LESTIDAE.

*Lestes sponsa* Hansemann.—Distribution as detailed in the introduction.

#### CORDULEGASTERIDAE.

*Cordulegaster boltonii* Don.—Range as stated above; in the Outer Isles very rare indeed, and only captured on Mingulay near the landing place, on Muldoanich in the hollow in the centre of the island and in Hellisdale, just north of Beinn Mhor, on South Uist.

#### AESHNIDAE.

*Aeshna juncea* L.—Quite common everywhere, both as larvae and adults, throughout all suitable islands in the Inner and Outer Hebrides. A gynandromorphic individual was taken in the Inverarish district of Raasay.

*A. cyanea* Müller.—Probably an immigrant, and only seen on South Rona and Raasay.

#### CORDULIIDAE.

*Somatoclora arctica* Zett.—Observed only on the Isle of Rhum in the north of the island on the Torridonian sandstones. In that area, between Mullach Mhor and Meall a Ghoirtein at the 750 feet contour line, there lies a series of lochans and peat pools, and amongst these the present species may be taken in small numbers. It seems remarkable that Rhum, with its tremendous expanse of fresh water, should produce so few aquatic insects,

and that *Somatochlora arctica* should fail in the mountain massif and its associated lochs in the centre of the island, but occur in lower ground in the north where Alpine plants are absent.

#### LIBELLULIDAE.

*Libellula quadrimaculata* L.—Swarming as larvae and adults everywhere, even in the more remote isles of the Outer Group. One of the earliest Hebridean species, occurring freely on Coll and Tiree in the last weeks of May. Specimens from Taransay and the Monachs seem much more 'contrasty' than those captured elsewhere.

*Sympetrum danae* Sulz.—A late species, and therefore often missed; nevertheless, we have taken it on all the large islands, Inner and Outer, as well as on Benbecula, Soay, Canna, Scalpay, etc.

*S. striolatum nigrofemur* Selys.—Also of free occurrence on all the islands although only an odd specimen was taken on Canna.

King's College,

Newcastle upon Tyne.

November 4th, 1940.

#### Reviews.

'INSTRUCTIONS FOR COLLECTORS. No. 4A. Insects.' Compiled by JOHN SMART, Ph.D., with the assistance of other members of the Staff of the Department of Entomology,  $4\frac{3}{4} \times 6\frac{3}{4}$  in., pp. vi + 164, 42 figs. London (British Museum (Natural History)). 1940. Price 1/6.

Although intended primarily for the guidance of persons collecting insects for the British Museum, this little book contains much information of value to all entomologists. Entomological literature is curiously lacking in works of this nature, most of the data available being contained either in isolated papers in various journals or in books dealing with, usually, one group of insects only. It is therefore of great convenience to have in one volume the results of the combined experience of the various specialists of the British Museum. A welcome feature of the book is the extensive series of notes on the Orders of insects. These are illustrated by excellent text-figures and should prove very helpful to the general collector. The various types of apparatus used in collecting insects and methods of preservation, packing and storage are fully and clearly described and should do much to obviate that bane of the museum worker—good material ruined through lack of efficient treatment in the field. A comprehensive index facilitates rapid reference and greatly adds to the usefulness of the book. One wishes that a companion volume of the same high standard on entomological technique in general could be produced.—ERNEST TAYLOR.

'INDIAN FARMING.' Issued by the Imperial Council of Agricultural Research, Delhi. Vol. I, No. 1, 8vo, 50 pp., 11 pls., January, 1940. Price 6 Rs. per annum.

This new monthly Journal takes the place of *Agriculture and Live-Stock in India*. The first number contains an article on Beekeeping in India by Khan A. Rahman and Sardar Singh, and longer or shorter contributions on economic entomology occur in most issues. The plates are exceptionally well produced and the text informative without being too technical.

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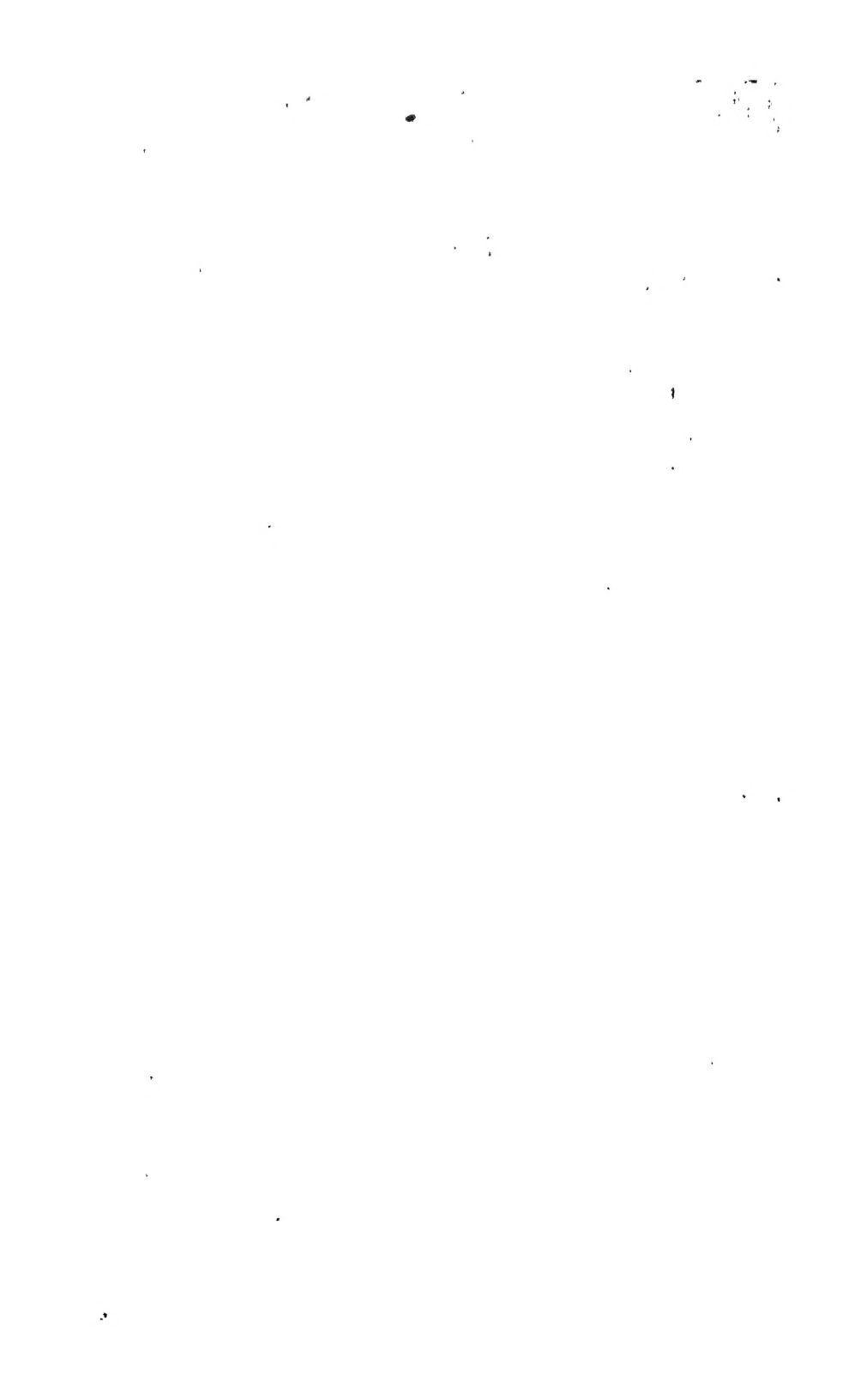
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